METROPOLITAN GOVERNMENT
OF
NASHVILLE AND DAVIDSON COUNTY

NASHVILLE DEPARTMENT of TRANSPORTATION
& MULTIMODAL INFRASTRUCTURE

# Volume 2: Construction Management Manual

**2021 EDITION**

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Reviewed by Chief Engineer Date

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Approved by NDOT Director Date

# Table of Contents

# 1. INTRODUCTION

The procedures and guidance identified in this Construction Management Manual (CMM) are intended for use in the management of construction for all Nashville Department of Transportation and Multimodal Infrastructure (Nashville DOT or NDOT) capital projects. While the size and level of complexity will not be the same for all projects, the principles and procedures of this manual must be adopted and used.

The purpose of this manual is to provide the basis upon which the NDOT will administer and manage construction contracts to deliver safe, high-quality, cost-effective, and timely construction projects for the residents of Metro Nashville and Davidson County. The procedures of this manual provide guidelines by which the NDOT staff and Consultants can perform professional services in the administration and management of each contract. The Chief Engineer will provide the necessary overview and supervision for compliance with the procedures contained herein with the assistance of the Program Process Management & Contract Administration Division. This manual provides management objectives and the procedures for implementing these objectives. Procedures are to be implemented to the extent provided with any working variances approved by the Chief Engineer. Whenever specific directions or procedures are contained in the Contract Documents and the Plans and Specifications, for an individual contract, the Contract Documents shall take precedence over this manual. Additional guidance and reference can be found in the latest edition of the Tennessee Department of Transportation's (TDOT) references: TDOT Standard Specifications for Road and Bridge Construction, Special Provisions, Circular Letters and other related information on TDOT's Construction webpage.

As the public continues to take more interest in matters affecting their community, public perception becomes more important to the construction process. Media and general public attention can be expected to focus more frequently on projects, particularly those that will have a major impact on the environment, public amenities, local economy, and transportation. All NDOT personnel need to promote and maintain a positive and professional public image. In addition to being efficient and incorruptible, they must also avoid any action that might be misinterpreted or misrepresented.

The Master Electronic Copy of this manual is located on NDOT's Sharepoint site.

# 2. ORGANIZATION

## 2.1. Organization

See Appendix 2.A for the NDOT organizational chart.

## 2.2. Limits of Authority

All personnel should be familiar with the limits of their authority. The NDOT Project Managers and Inspectors do not have the authority to change or relax any specification. They may be granted authority to make minor changes in the plans. They must seek higher authority for making or approving any change that would materially affect the design or cost of work. They do not have the authority to make anything other than minor changes to the plans.

## 2.3. Assignment of Responsibilities

The Division Manager has the responsibility for conducting the business of Metro relating to construction as identified in these procedures. They may, and usually does, delegate some of these responsibilities to other personnel under her/his supervision. The Division Manager will coordinate any changes to the plans with the Project Manager.

## 2.4. Divisions

Divisions within the Department including Infrastructure Development and Delivery and Infrastructure Operations and Asset Management may have capital improvement construction projects in which the respective Manager is designated as the Project Manager.

## 2.5. Staff Supplementation

Metro may hire outside consultants/contractors to fill positions that are normally held by Department employees. These employees will report to the Division Manager as supplemental Department staff.

# 3. ROLES AND RESPONSIBILITIES

## 3.1. Chief Engineer

The Chief Engineer is the NDOT Assistant Director responsible for the administration and management of the Infrastructure Development and Delivery Department (Engineering). The Chief Engineer serves as Engineering's main point of contact for interactions with the Mayor's Office, Metro Council, other Metropolitan Government departments and outside agencies. The Chief Engineer is ultimately is responsible for developing and maintaining Metro's streets, bridges, sidewalks, bikeways, street lighting, traffic management, signal system and smart mobility infrastructure while working to ensure the safety and well-being of each person traveling in Davidson County.

## 3.2. Division Manager

The Division Manager is responsible for the overall management of a specific divisions of Engineer's Planning, Design or Delivery sections. The Division Manager serves as the supervisor of the Project Managers and supporting staff in their division and the coordinator/liaison between their division, other Divisions, and the Chief Engineer. The responsibilities of the Division Manager or their delegated representative during the Construction Phase include, but are not limited to:

- Prepare/review correspondence as required.
- Review the proposed construction plans to ensure constructability.
- Coordinate pre-bid and pre-construction conferences with Project Manager.
- Schedule/attend/conduct pre-bid conferences and pre-construction conferences.
- Determine required staffing levels for projects and/or construction project teams.
- Attend/conduct conferences/field inspections to monitor the progress of the Contractor's activities and operations vs. Contract requirements.
- Have a thorough knowledge of the Specifications and Contract requirements.
- Troubleshoot problems and seek resolution.
- Review proposals for changes/additional work and make recommendation to Chief Engineer for approval/disapproval.
- Prepare/process Supplemental Agreements, Change Orders, Unit Price Contracts, time extensions, and claims for additional compensation.
- Review and ensure timely response/investigation of complaints/ inquiries concerning construction.
- Review and approve monthly progress estimates before submitting for payment.

- Monitor employee safety requirements and programs.
- Coordinate with the Contract Administrator as needed on all TDOT locally managed projects with Federal/State funding and all projects impacting TDOT jurisdiction.
- Recommend Final Inspection and close-out of project.

## 3.3. Contracts and Agreements Compliance Manager

The role of the Contracts and Agreements Compliance Manager is the overall administration of project contracts and agreements to ensure compliance with all Metro, State, and Federal requirements, processes and procedures. They serve as the liaison between TDOT Local Programs Development Office (LPDO) and NDOT's Engineering Department. The responsibilities of the Contracts and Agreements Compliance Manager include:

- Have a thorough knowledge of the contract/agreement requirements, TDOT Local Government Guidelines Manual (LGGM), plan specifications, Special Provisions, material requirements, and limits of authority.
- Ensure all TDOT submittals are made in order to obtain the Notice to Proceed (NTP) for each phase of work.
- Review/recommend proposed changes/additional work and present information and recommendation to the Division Manager.
- Evaluate prices and make recommendation to the Division Manager concerning proposed changes/additional work.
- Review contractor construction schedules for progress, updates, and proposed revisions.
- Coordinate with Department communications group to ensure all website information is kept up to date.
- Provide information to Department communications for weekly email updates.
- Conduct prompt contact with concerned citizens and investigation of complaints and inquiries and report findings to the Division Manager; seek resolution and provide follow-up until resolved.
- Ensure Notice of Intent (NOI), Notice of Termination (NOT), and any other required documents are submitted in accordance with NPDES permit.
- Prepare all projects for contract closeout and records retention.
- Ensure proper documentation and record keeping in accordance with Metro policies and procedures and in accordance with TDOT requirements if state/federally funded.
- Draft/review correspondence for Chief Engineer, Director, or Division Manager, as directed.
- Prepare/process monthly requests for TDOT reimbursements.
- Maintain a record of general comments on projects as needed, including instructions given or received and any problems noted.

- Enter the appropriate data into Metro's project management system, for the proper monitoring of progress and related costs for all projects, including monthly progress estimates and milestone dates.
- Other duties as may be directed by the Chief Engineer.

## 3.4. Project Manager

The role of the Project Manager is the field management of construction for several projects. The responsibilities of the Project Manager include:

- Supervision and management of the Construction Inspector(s) for multiple concurrent projects.
- Have a thorough knowledge of the Specifications, Special Provisions, Contract requirements, material requirements, and limits of authority.
- Review plans and attend plan review meetings.
- Assist Division Manager with final review for constructability of proposed plans.
- Attend pre-bid conferences and pre-construction conferences.
- Review/recommend proposed changes/additional work and present information and recommendation to the Division Manager.
- Negotiate, evaluate prices, and make recommendation to the Division Manager concerning proposed changes/additional work.
- Review construction progress with each project Construction Inspector for substantial compliance with applicable Specifications and Plans, quality of workmanship, safety, good construction practices, schedule, and adequate testing.
- Conduct prompt investigation of complaints and inquiries and report findings to the Division Manager; seek resolution and follow-up until issue is resolved.
- Review/process monthly invoices for payment.
- Attend Final Inspection; make recommendations regarding project acceptance to the Division Manager.
- Provide direction and/or training as needed for the Construction Inspectors.
- Maintain a diary with general comments on all projects, including instructions given or received and any problems noted.
- Review accuracy/completeness of documents to support all pay quantities for assigned projects.
- Coordinate with TDOT as needed on all projects with Federal/State funding or within TDOT jurisdiction.
- Other duties as may be directed by the Division Manager.

## 3.5. Construction Inspector

The role of the Construction Inspector is to monitor construction projects for substantial compliance with the Plans, Specifications and Contract requirements. A Project Manager may be assigned as Construction Inspector for a project, usually a complex or unusual project, as determined by the Division Manager. The Construction Inspector serves as a liaison between Metro and the Contractor. The responsibilities of the Construction Inspector include:

- Have a thorough knowledge and understanding of individual plans, Specifications, and limits of authority for assigned project(s).
- Maintain records and documentation of Contractor's progress in accordance with Metro procedures such as pay item reports, weight tickets, depth checks, and other measurements.
- On projects with Federal/State funding, maintain records and documentation in strict accordance with TDOT procedures.
- Maintain daily diary of chronological events on each assigned project including, but not limited to: work performed, Contractor and Subcontractor representative on project, visitors to the project, instructions received and given, and weather information.
- Complete and maintain a detailed record of all field measurements and calculations of quantities for all Contract pay items.
- Review accuracy/completeness of documents to support all pay quantities for assigned projects.
- Maintain "As-Built" plans for all field changes/revisions.
- Schedule necessary testing of each phase of work and each type of material.
- Attend meetings for review of progress with the Contractor.
- Investigate all complaints and inquiries immediately upon notification and report to the Project Engineer and Division Manager; follow up until resolved.
- Keep management fully informed of the progress of the projects and any problems that may have developed.
- At the start or anticipated start of each scheduled activity or different Contractor's operation, review plans, Specifications, Contract requirements, schedule, or Special Provisions to be familiar with the activity's requirements.
- Attend pre-construction and construction progress conferences.
- Make every reasonable effort to create and maintain a good relationship with the property owners adjacent to the project.
- Review traffic control activities on a continuing basis to ensure appropriate traffic control devices have been placed in accordance with the Project requirements and MUTCD. Issue directions for any required corrective action in writing with time limit specified.

- Review erosion prevention and sedimentation control (EPSC) plans and activities on a continuing basis and issue directions for any required corrective action in writing with time limit specified. Review Contractor submitted EPSC reports and inspect the project for compliance and concurrence with the current NPDES permit.
- Other duties as may be directed by the Division Manager and Construction Project Engineer.

## 3.6. Construction Utility Coordinator

The role of the Construction Utility Coordinator is to serve as a primary point of contact between all utility owners and Metro. The responsibilities of the Construction Utility Coordinator include:

- Coordinate with Pre-Construction Utility Coordinator on each project.
- Identify and notify all affected utility owners, in conjunction with the Design Project Manager, on every project.
- Attend pre-bid conferences and pre-construction conferences to provide utility contacts and other information to contractors
- Provide utility cost estimates
- Review utility relocation plans, schedules, and estimates for compliance
- Conduct utility coordination meetings during the plan development process
- Review utility permit requests for conflicts with proposed and active projects
- Conduct prior rights research on reimbursement claims
- Certify utility relocations for construction and for TDOT funding
- Distribute preliminary and final plans and revisions to, utility owners.
- Issue Notice to Proceed-Utilities as soon as final construction (bid) plans are available.
- Attend contractor utility coordination meetings for all projects
- Coordinate with Pre-Construction Utility Coordinator

## 3.7. Development Services Manager

This section is reserved for future updates.

## 3.8. Traffic Engineer

This section is reserved for future updates.

## 3.9. Construction Permit Manager

This section is reserved for future updates.

## 3.10. Permit Inspector

This section is reserved for future updates.

## 3.11. Development Inspector

This section is reserved for future updates.

# 4. PROJECT MANAGEMENT PROCESS

## 4.1. Project Schedule Overview

Depending on the funding received for a Capital Improvement Project (CIP), each project may require different project management processes. Infrastructure projects fully or majority funded with Metro capital improvement dollars should follow the processes and procedures established by Metro Charter, Regulation, or the Department. Transportation projects funded with Federal Highway Administration (FHWA) and State Highway funds that are managed by Metro through agreements with TDOT are required by law, regulation, rule, policy, and standard to follow the processes and procedures outlined in the TDOT Local Government Guidelines Manual.

### 4.1.1. Construction Phase Flowchart for Metro Funded Project

See Exhibit 4.1 for the steps involved in the management of the construction phase on Metro funded projects.

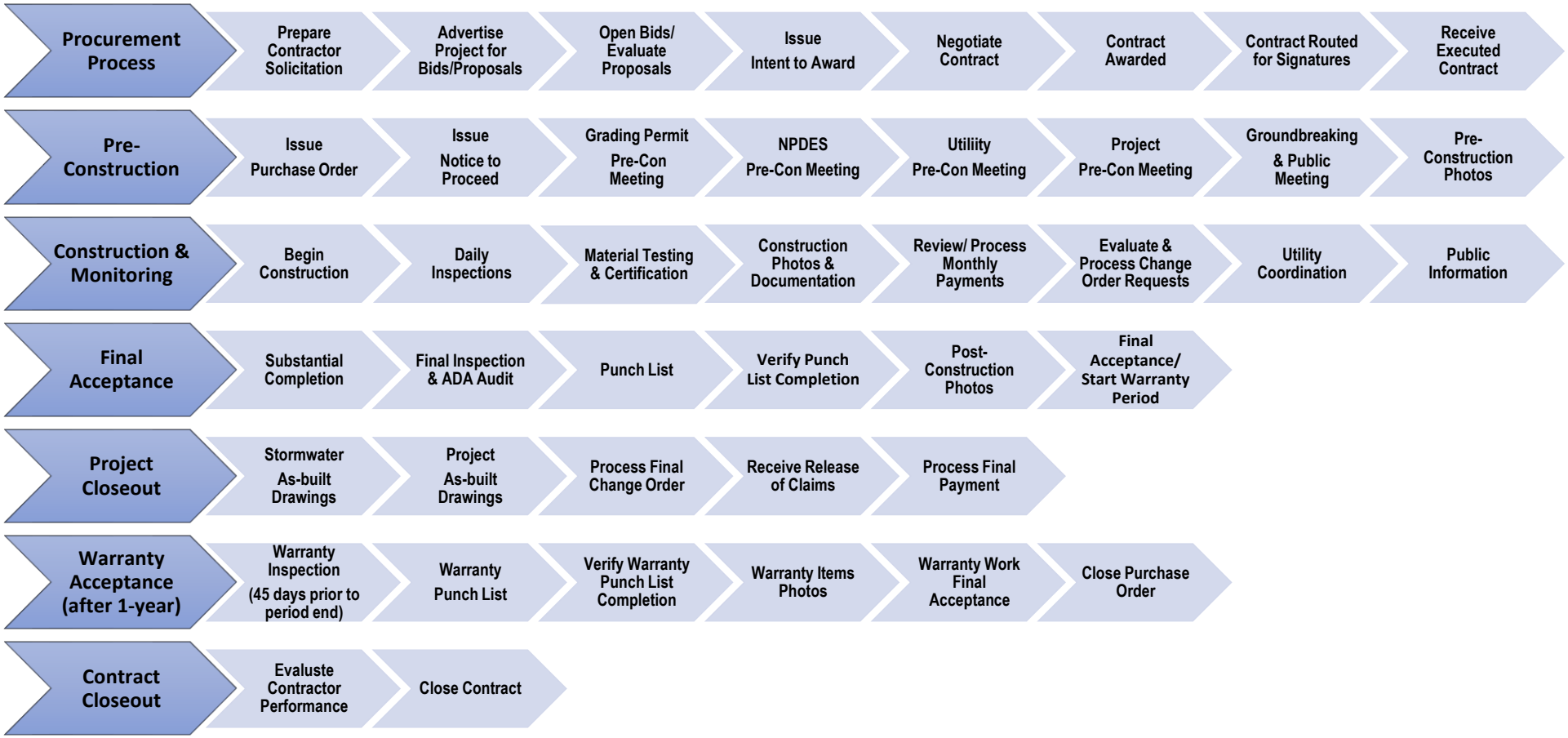
### 4.1.2. Construction Phase Flowchart for Federal/State Funded Project

See Exhibit 4.2 for the steps involved in the management of the construction phase on Federal or State funded capital projects.

## 4.2. Construction Phase Detailed Project Schedule

See Exhibits 4.3 and 4.4 for a breakdown and schedule of overall project stages for Metro funded and Federal/State funded projects.

## Exhibit 4.1 - Construction Phase Flowchart for Metro Funded Projects



## Exhibit 4.2 - Construction Phase Flowchart for Federal/State Funded Projects

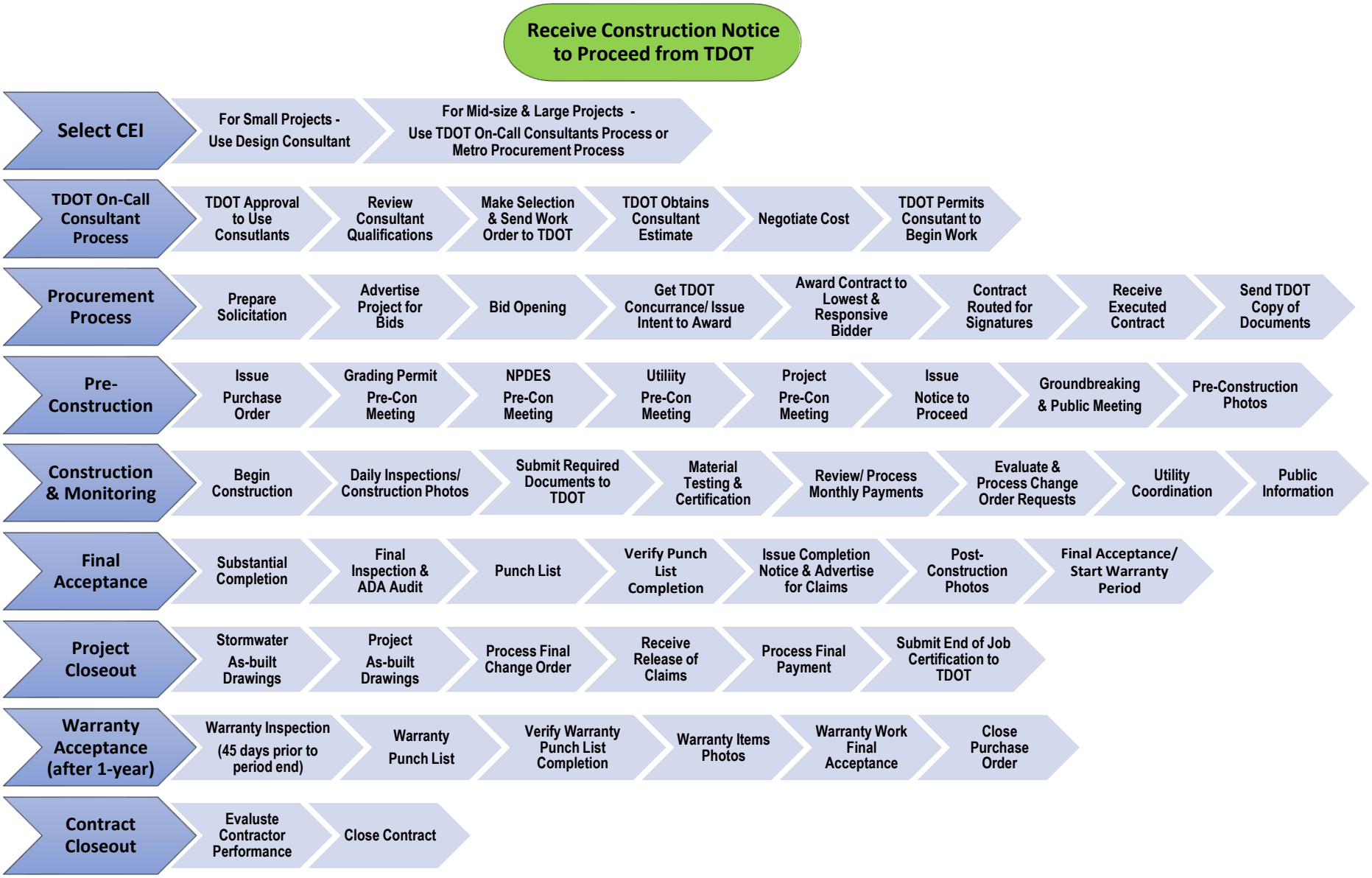


**EXHIBIT 4.3**

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 0 | CIP Master Metro Project Schedule | 931 days | Mon 1/25/21 | Mon 8/19/24 |
| 1 | 1 Project Administration | 103 days | Mon 1/25/21 | Wed 6/16/21 |
| 20 | 2 Project Scoping/Functional Layout | 64 days | Thu 6/17/21 | Tue 9/14/21 |
| 36 | 3 Preliminary & Right of Way Plans | 213 days | Mon 1/25/21 | Wed 11/17/21 |
| 57 | 4 Permits (only those that are necessary) | 434 days | Thu 4/15/21 | Tue 12/13/22 |
| 87 | 5 Prepare Final ROW Plans & Cost Estimat | 27 days | Fri 5/14/21 | Mon 6/21/21 |
| 91 | 6 Right of Way Acquisition (Adjust durations according to number of tracts) | 306 days | Fri 6/11/21 | Fri 8/12/22 |
| 114 | 7 Construction Plans Preparation | 260 days | Fri 5/7/21 | Thu 5/5/22 |
| 124 | 8 Obtain Contractor and Construction Engineering Inspector (CEI) | 78 days | Mon 4/25/22 | Wed 8/10/22 |
| 154 | 9 Construction Phase | 263 days | Thu 8/11/22 | Mon 8/14/23 |
| 185 | 10 Project Closeout and Documentation Phase | 270 days | Tue 8/8/23 | Mon 8/19/24 |

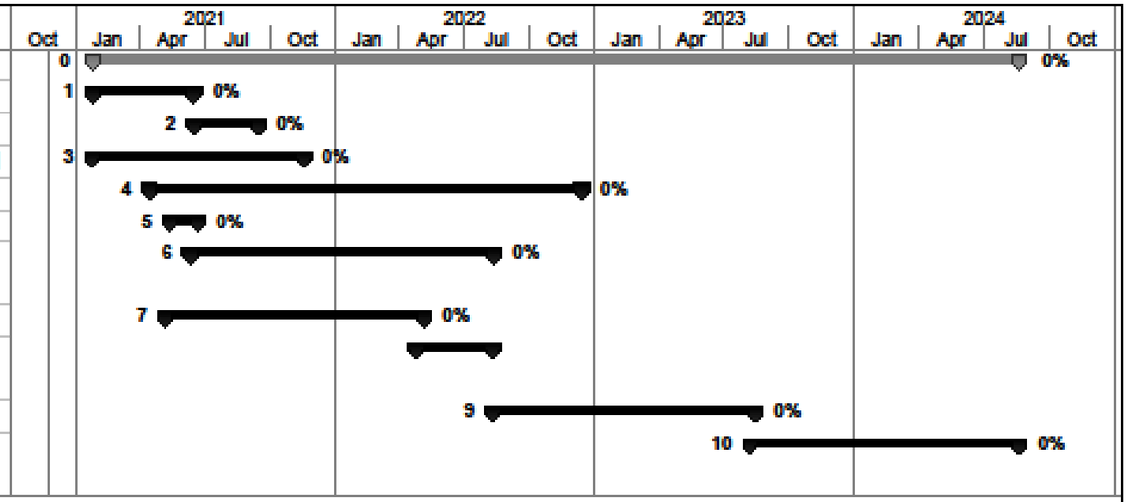



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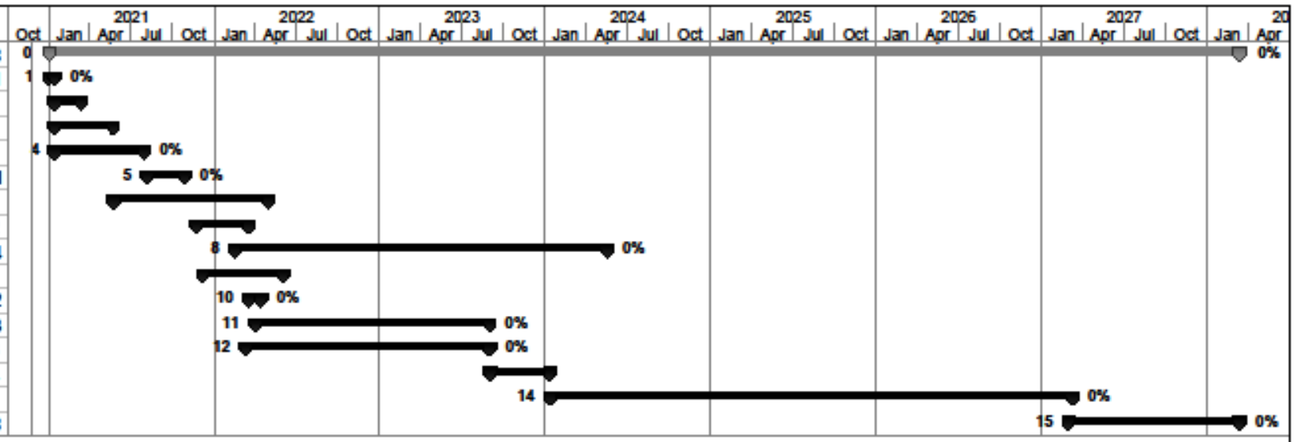
**EXHIBIT 4.4**

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 0 | CIP Master TDOT Funded Project KJ 2019 | 1876.13 da... | Fri 1/1/21 | Mon 3/13/28 |
| 1 | 1 Project Administration | 9 days | Fri 1/1/21 | Wed 1/13/21 |
| 7 | 2 Ammend TIP (if needed) | 41 days | Thu 1/14/21 | Thu 3/11/21 |
| 10 | 3 TDOT Project Initiation Phase | 92 days | Thu 1/14/21 | Fri 5/21/21 |
| 24 | 4 Consultant Selection Process | 141 days | Thu 1/14/21 | Thu 7/29/21 |
| 49 | 5 Project Scoping/Functional Layout | 58 days | Fri 8/6/21 | Tue 10/26/21 |
| 65 | 6 PE - NEPA Phase | 245 days | Mon 5/24/21 | Fri 4/29/22 |
| 89 | 7 PE Design Phase | 84 days | Mon 11/22/21 | Thu 3/17/22 |
| 119 | 8 Permits (only those that are necessary) | 586 days | Wed 2/16/22 | Wed 5/15/24 |
| 150 | 9 Obtain ROW Manager & Acquisition Team | 128 days | Tue 12/7/21 | Thu 6/2/22 |
| 162 | 10 Prepare Final ROW Plans & Cost Estimate | 19 days | Fri 3/18/22 | Wed 4/13/22 |
| 169 | 11 Right of Way Acquisition (Adjust durations according t | 369 days | Fri 4/1/22 | Wed 8/30/23 |
| 215 | 12 Construction Plans Preparation | 385 days | Fri 3/11/22 | Thu 8/31/23 |
| 228 | 13 Obtain Contractor and Construction Engineering Inspe | 95 days | Fri 9/1/23 | Thu 1/11/24 |
| 251 | 14 Construction Phase | 822.13 days | Fri 1/12/24 | Tue 3/9/27 |
| 285 | 15 Project Closeout and Documentation Phase | 270 days | Mon 3/1/27 | Mon 3/13/28 |

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# 5. CONTRACT ADMINISTRATION

The Project Manager is responsible for the administration of each Construction Contract. The Inspector is responsible for the construction project administration in coordination with the Metro Project Manager. This section provides for the general administrative requirements for the day-to-day administration of a Construction Contract.

## 5.1. Financial Management

Financial/Budget monitoring is accomplished at both the project and Program levels. Project budget monitoring whether it is for planning, design, or construction, is primarily focused on verifying that the contract values are not being exceeded and that all contract scope requirements have been met and provided in a quality manner. While most of this work involves validating the actual progress of the project work including pay requests and change orders for added scope, another equally critical need is to proactively look for indicators that provide early information that budget variations may be on the horizon.

The Financial Management functionality is achieved using Metro's financial management system. The financial management system is designed to provide Program and Project Managers with the tools needed to manage and track project/program budget allocations, encumbrances, and final costs as well as planned/actual project start and end dates.

The financial management responsibilities of the Program/Project Managers are summarized below:

- Conduct regular Program/Project budget updates based on monthly invoices, change orders, scope changes, etc.
- Support Management with annual capital budgeting needs
- Track and control Program/Project expenditures as well as Project Program/Project cash flow to assure that monies are available to complete projects
- Track the funding source (Business Units) for overall financial health

## 5.2. Project File Management

File management will be used during the construction phase for both Metro Funded and TDOT Funded projects. During the life of a Contract, an array of documents is generated pertaining to the Contract or the functions of the Department. These documents may include various correspondence, electronic mail (e-mail), memoranda, meeting minutes, Contractor submittals

and submission forms, reports, test results, progress records and photographs, drawing clarifications and as-builts, plan revisions, and pending changes. These documents constitute the official Contract records as well as the functional files of the Division Manager's office.

The Project Manager is overall responsible for assuring that the official contract files for each construction contract are maintained. The official files shall contain all correspondence, e-mails, daily reports/diaries, test results, administrative records, other reports, and contract drawings. The electronic and hardcopy files will be maintained and stored using the same file structure. All documents need to be scanned and saved to the appropriate project directory on Metro's network server on a regular basis. The Inspector shall also use the established file structure when storing construction files. If a consultant has been hired to perform CEI services, the Project Manager will provide them with a SharePoint site link or some other file sharing software or database, approved by Metro ITS, to use for transferring project files to the Project Manager for storage in the project files on the network.

The filing of all contract files shall be neatly organized in a way to properly document and record them for direct and easy access. The following display outlines the type files that shall be provided for both Metro and TDOT funded projects. Both structures show similarities in file names with some exceptions. Additional project files may be added as deemed necessary.

**Metro File Structure - Construction**

- *Shop submittals* – this folder will be used by the project manager to store all shop drawings and other related shop submittals from the construction contractor.
- *Construction Phasing Plan* – the project manager will receive the phasing plan from the construction contractor and store in this folder.
- *Daily Inspection Reports* – all daily reports from the construction inspector will be stored in this folder.
- *Sidewalk and Ramp Inspection Reports* – inspectors shall place all curb ramp and sidewalk reports into this folder.
- *Construction Completion* – the construction manager responsible for all final reports, data sheets, summary reports, acceptance, and the approval form for final payment of invoice will file all said documents into this folder.

**TDOT File Structure – Construction**

For complete details of all required TDOT documentation, please refer to the TDOT Local Programs Guidance Manual Form 8-16 Construction Project Files.

- Correspondence
- Pay Item

- Engineer's Estimate
- Sub-Contract
- Plans Revisions
- Shop Drawings
- DBE
- Utility
- Utility Name(s)
- Trainee
- Environmental
- Environmental (Construction Storm Water Inspection Certification)
- Environmental (EPSC)
- Safety (Accidents)
- Contractor Name Payroll
- Employee Interviews
- Change Orders
- Job Mix Formulas
- Concrete Designs
- TCD Checklist
- Prompt Payment
- Monthly Construction Report
- Attestation of Illegal Immigrants
- Contractor Performance Evaluation
- End of Job

## 5.3. Contract Correspondence and Communication

Formal correspondence, electronic submittals, and electronic mail are the primary forms of documentation for contract administration. It is essential that all correspondence be deliberate, appropriate, and complete. When possible, all correspondence and communication related to the project contract should be saved in the project folder in electronic format. Other forms of communication that are important, and for which permanent records must be kept, are submittals, transmittals, meetings, telephone calls, and field discussions. Minutes of meetings, memoranda to the Contract file, and photographs can be used to document Contract occurrences or agreements. All documentation must include dates and/or times if relevant, locations, parties involved, important aspects discussed, decisions reached, action items and who is responsible for those action items.

All correspondence must conform to Metro standards, including electronic mail and other internal correspondence to staff groups within the Department or with other Departments.

Incoming correspondence should be answered in a timely manner unless the subject matter is non-substantive, e.g., transmittal of monthly reports.

Email shall be used to forward information to the Contractor or within the Department whenever possible. When email is not appropriate (hard copy required, large documents, etc.) a formal Transmittal form shall be used.

Any item addressed in correspondence, telephone conversations, meetings, or discussions which require further action and/or resolution by any party should be flagged or noted/listed as such in the official documentation. These Action Items should identify the party responsible for the action or resolution of the item, the date of the request for action, the date action required, and the date of resolution. The purpose of the Action Items List is to ensure that any item which cannot be resolved immediately is not overlooked, resulting in potential delays.

## 5.4. Contract Documents

The Project Manager is responsible for maintaining an up-to-date executed copy of the Construction Contract. Contracts documents are submitted to the Metro Department of Finance, Purchasing Division. Once a contract has been accepted and executed, the NDOT project manager should request an electronic copy of the documents. The copies are to be saved in the project folder on the server.

The Contract file includes, but is not limited to, the following:

1. Advertisement
2. Bid documents (Proposal, Addenda, Bid Items, Bid Schedule, Bid Bond)
3. Executed contract (Include Payment Bond, Performance Bond, Insurance Documents, and other contract forms and affidavits)
4. Specifications
5. Supplemental Specifications
6. Project Special Provisions
7. Project Plans and Revisions
8. Notice to Proceed Letter
9. Change Orders
10. Supplemental Agreements
11. Time Extension Agreements
12. Substantial Completion Letter
13. Final Acceptance Letter
14. Warranty Letter
15. Final Acceptance of Warranty Work Letter

No oral agreement or directions are to be considered as valid or as part of the Contract.

The Inspector is responsible for maintaining on file a current marked-up set of full-size Contract record drawings showing "as-constructed" or "as-built" details. The Inspector is also responsible for reviewing the "as-built" information provided by the personnel assigned to the project.

## 5.5. Submittals

The Contractor is responsible for preparing submissions of technical information in accordance with the terms of the Contract. The information may be working drawings, shop fabrication drawings, design drawings (where the Contract Drawings are schematic or conceptual), design calculations, manufacturer's information, test procedures, test data, and product certifications. The Contractor's shop drawings and working drawings provide the Project Manager and his inspection staff with specific details of the Contractor's work. The Inspector is responsible for maintaining an up-to-date set of submittal drawings for the inspection staff.

Submittals must comply in number, style, and format with the requirements of the Contract, Plans and Specifications. Each submittal must be logged in a submittal register by the CEI for the Project Manager and must be reviewed and returned with appropriate comments within the contractually specified period.

## 5.6. Annual Unit Price Contracts and Smaller, Less Complex Projects

On smaller, less complex projects, there is often an urgency, due to road closures, safety concerns, school or major facility opening, or other factors, that require these projects to be constructed quickly. These smaller, less complex projects do not usually go through the normal plan development process. There may be no “plans” available, other than a GIS map marked to show the needed work. Nevertheless, it is critical to follow the construction management principles and procedures in this manual. At a minimum, the following procedures must be in place before proceeding with construction using an Annual Contractor (AC), (unless specifically directed by the Chief Engineer or Director):

- Project Manager is assigned.
- Funding is verified and in place.
- Cost estimate is obtained from AC to verify identified funding is adequate.
- Utility facilities and potential conflicts are identified; Notify utility owners.
- Plan approved by Chief Engineer, or by appropriate Departmental personnel.
- CEI is obtained or assigned.
- Contractors Payment and Performance Bonds, Insurance, and Purchase Order (PO) are secured.
- Time of completion is specified

- Pre-Construction Meeting is held.
- Notice to Proceed Letter is issued to AC.
- Quantities monitored and projected to completion, cost control.
- Work cannot be authorized over the PO amount without Project Manager approval and concurrence from a Section Manager, Assistant Director or the Chief Engineer.
- Substantial Completion Letter is received from AC.
- Final Inspection completed.
- Punchlist work completed.
- Final Change Order
- Final Acceptance Letter and Warranty Notification issued
- Final Payment
- Close PO

## 5.7. Federal/State Funded Agreements and Contracts

Projects that include Federal/State funding require additional administrative procedures than those projects that are funded solely with Metro dollars. A project may be funded for all or part of a project (Environmental/NEPA, Design, ROW, Construction). ***Any amount of federal funding on a project federalizes the entire project*** which must follow all applicable federal and State regulations, laws, and procedures. Projects being considered must be included in the Transportation Improvement Program (TIP) (in the case of urban areas over 50,000 population) and has been presented to the Metropolitan Planning Organization (MPO).

Prior to the receipt of grant funds for a project, the Metro Planning Department shall accept the award of any Federal/State grant funding from the MPO for a project. The Department who will manage the project shall request the award of a contract, by submitting to the TDOT Local Programs Development Office (LPDO) a Project Initiation Package in accordance with the Local Government Guidelines (LGG) Project Initiation Form and Checklist (Form 3-1). This process will result in a contractual Agreement between TDOT and Metro for an entire project or a project phase (NEPA, Design, ROW, Construction), that has been approved by Metro Council, signed by the Mayor and executed by the TDOT Commissioner.

Once an Agreement is in place, multiple Metro Departments have a role in the administration of the Agreement and project are obligated to follow all requirements, policies and procedures of the Agreement and the TDOT Local Government Guidelines Manual (LGGM). **Not following these regulations, laws, requirements, policies and procedures will put ALL of Metro's TDOT projects (regardless of the Department who is managing it) at risk of having the Federal/State funds rescinded by TDOT!**

**Metro-wide Responsibility.** Departments with some responsibility in administering the Agreement and/or project may include, but are not limited to:

- **Contracting Department (typically NDOT, Parks, Planning)** – Contract Administration and Project Management
- **Human Rights Commission** – Civil Rights Coordinator Certified in Title VI (Title VI Training through TDOT required)
- **Human Resources Department** – Equal Employment Opportunity (EEO) Officer
- **Metro Finance Department**
  - **Office of Financial Accountability** – A-133 Audit Verification
  - **Procurement** – Consultant and Contractor Selection
  - **DBE Office** – DBE Liaison
  - **Public Property** – ROW Acquisition, if not consulted out.
  - **Other Finance Staff** – Grants, Payments and Deposits
- **General Services Department or Contracting Department** - ADA Transition Plan
- **Other agencies/departments/Metro staff** may have responsibilities to this Agreement and/or contracts depending upon if Metro enters a Memorandum of Understanding with any agency (WeGo, MNAA, etc.), or if Metro personnel is used to do all or part of the work through Force Account (using Metro staff to perform the work).

**Departmental Responsibility.** In accordance with Federal Regulation 23 CFR 635.105 – Supervising Agency, Metro must provide a full time employee to be in "responsible charge "of the project. This is done using the LGG Responsible Charge Form (Form 1-1). A "Project Supervisor" must also be designated. This person does not have to be an engineer but is required regardless if a consultant has been hired to manage all or part of the engineering activities, including design and construction engineering and inspection (CEI) services. The Project Manager shall serve as the "Responsible Charge" and "Project Supervisor" for the project and is responsible for the administration of the project. If design and construction duties are handled by separate individuals on a project, each employee, and the phase of the project they are responsible for will have to be identified separately on the Responsible Charge Form. if the Responsible Person in Charge changes during any phase or duty, the LPDO must be notified by updating Form 1-1.

Duties of the Project Manager include, but are not limited to:

- This person acts as the primary point of contact for Metro for the project they are assigned to.
- Requests authorization of funds from MPO/TDOT.
- Requests award of contract.
- Oversees project activities; cost, time adherence to contract requirements, design and construction quality and scope.
- Ensures the contract is properly recorded.
- Ensures accountability of contract compliance.
- Directs project staff (Metro or consultant) to carry out project administration and contract oversight including proper documentation.
- Is aware of the qualifications, assignments and on-the-job performance of the Metro and consultant staff at all stages of the project.
- Makes or participates in decisions about changed conditions or scope changes that require change orders or supplemental agreements.
- Reviews financial processes, transactions and documentation to ensure that safeguards are in place to minimize fraud, waste and abuse.
- Maintains familiarity of day-to-day project operations & safety issues.
- Visits and reviews the project on a frequency that is proportionate with the magnitude and complexity of the project.
- Attends all project related meetings.

TDOT requires local municipalities and professional engineering firms to take the Local Government Guidelines Manual & Right-of-Way Training and the Construction Engineering and Inspection (CEI) Training Course in order to locally manage a TDOT project through the Local Programs Development Office. Table 5-1 below outlines what Metro Departments/personnel and consultants are required to take one or more of these trainings:

| Table 5-1 | WHO NEEDS TDOT TRAINING? | | | |
|---|---|---|---|---|
| **Department** | **Personnel** | **LGGM & ROW Training*** | **CEI Training** | **Other Required Training** |
| Contracting Department | Program Manager, Force Account Staff & all Consultants | Required | Required | -- |
| Human Rights Commission | Civil Rights/Title VI Coordinator | Required | -- | Title VI |
| Human Resources | EEO Officer | Required | -- | -- |
| Metro Finance Office of Financial Accountability | Finance Officer and other staff | Optional | -- | -- |
| Metro Finance Procurement | Purchasing Agent and other staff | Required | -- | -- |
| Metro Finance DBE Office | DBE Liaison | Required | -- | -- |
| Metro Finance Public Property | Right-of-Way Officer and ROW acquisition consultants | Required | -- | -- |
| General Services or Contracting Department | ADA Compliance Officer | Optional | -- | -- |

**Construction Phase Administration.** TDOT will issue to Metro a Construction Notice to Proceed (NTP) for the project after the following actions have taken place:

- NEPA must be complete, and a determination made (CE, FONSI, EIS, etc.)
- TDOT ROW Certification has been received.
- TDOT Utility and Railroad Certification has been received.
- Receive TDOT Approval of Permits

- On-the-Job Training Goal/Program has been established and approved by the Metro Civil Rights Coordinator and TDOT.
- DBE Goal has been established by Metro and approved by TDOT.
- Final Engineering Estimate must be received from consultant.
- Final Construction Plans, Specification and Bid Book approved by TDOT.

Once the Construction NTP has been received from TDOT, the Project Manager may proceed with Preparing the solicitation packets to obtain the CEI (if not already acquired), Independent EPSC Inspector, and Construction Contractor.

## 5.8. Participation Agreements with Developers

Public/Private Participation Agreements (PA) are typically negotiated by the Mayor's Office and the Metro Council. Metro may contribute funds to the project for the developer to construct public infrastructure on Metro's behalf. The developer is required to request progress payments for the expenses of designing, constructing, inspecting, and managing the project. The Metro Department responsible for accepting the final constructed infrastructure, will assign a Project Manager to be responsible for the review and approval of the progress payments. It is the responsibility of the Developer's Project Engineer and Project Inspector to ensure that all work conforms with the language and terms of the participation agreement.

Depending upon the size and scope of the project, the role of the Project Inspector may be performed in-house by NDOT personnel or contracted out. In many cases the developer will be required to pay for CEI.

In the case where new public streets are being constructed, NDOT Development and Permit Inspectors will make a final inspection on the infrastructure that was constructed and create a punchlist. Metro Stormwater Compliance will inspect and ensure the storm drainage is also in compliance with the grading permit. Before Metro accepts for maintenance, the Project Manager shall verify that all punchlist items have been complete, all project issues are resolved, and all Metro Departments are satisfied with developers work. Once this is communicated to the NDOT inspectors, and if they are satisfied that the transportation infrastructure (sidewalks, bikeways, road, medians, planting zones, etc.) has been constructed in compliance with the approved plans and specifications, an acceptance letter will be written and distributed to the developer. The new street will then be added to the Official Street and Alley Map for future maintenance by Metro. The Project Manager will approve and pay the final payment after all expenditures have been verified and are in accordance with the PA and any unexpended funds will be returned to Metro. The PA will typically require the developer to provide a one-year warranty on the work performed.

# 6. PRE-CONSTRUCTION ACTIVITIES

## 6.1. Pre-Bid Procedures

Although the Engineer of Record is responsible for preparation of bid documents, the Project Manager and CEI will provide critical review and assistance for the following:

- **Bid Document and Plan Review.** When drawings are approximately 80-90% complete, a constructability review will be conducted by the Design Project Manager, CEI, Metro Water Services, Utility Owners, and other staff as available to review the project for constructability problems, construction staging, adequacy of right of way for construction, and utility relocations and coordination. Another critical area of review is that all the necessary bid items and special provisions are provided, and the quantities shown are correct.

- **Construction Duration/Schedule and Contract Duration.** Takes into account the amount and complexity of work, utility relocations, staging, traffic impacts, time of year, school activities/recess, special events in the area and so forth when setting the construction duration and schedule. The construction contract will be set by the Procurement Department. Metro contract terms are typically set for 5 years regardless of the construction duration. Recommend amount of Substantial Completion and Project Liquidated Damages.

- **Engineers Estimate.** Review and compare to bid tabulations from the most recent similar project(s), applying current market conditions.

- **Special Provisions.** Assist with preparation of and/or review Special Provisions for ROW stipulations, and other special aspects of the work.

- **Final Bid Document Review.** Including review of special studies like soil surveys, bridge foundation reports, right of way special provisions, etc.

- **Pre-Bid Conference**. The Pre-Bid Conference will be conducted by the Finance Department Purchasing Agent in accordance with Metro Procurement Regulations. The Project Manager along with the CEI shall attend the Pre-Bid Conference. The Project Manager shall also provide the Purchasing Agent with necessary information for the Pre-bid Conference.

- **Invitation to Bid (ITB) Amendments.** The Finance Department Purchasing Agent will prepare and issue all amendments to the Invitation to Bid (ITB). The Project Manager will be responsible for answering contractor's written questions provided to them by the Purchasing Agent. In no case should a contractor's question be sent directly to the Project Manager or answered verbally. All contractor's questions should be submitted in accordance with the instructions provided in the solicitation and at the Pre-Bid Conference.

## 6.2. Solicitation Packet Preparation

Once the bid documents have been prepared, the Project Manager will put together the solicitation packets for the CEI Services, Erosion Prevention and Sediment Control Inspection Services, and the Construction Contractor. All solicitation packets shall include the latest version of the following documents which can be found on the InsideMetro intranet site: http://im/finance/procurement/r12.asp

- Solicitation Request Form (Appendix 6.A)
- EBO Cost Breakdown (Appendix 6.B)

In addition to these forms, provide the following information on the SRF and submit the listed documents:

### 6.2.1. Construction Engineering and Inspection (CEI) Service

This service is required for all projects under construction and should be acquired prior to the construction contractor. They should be under contract prior to the pre-bid conference, but no later than the first pre-construction meeting (grading permit, NPDES permit, NES, departmental, etc.) on the Metro project schedule.

- Request is for an Architectural and Engineering (A/E) Service
- Contract term: 5 years or End of Construction
- Select Background Check if access to Metro databases and/or services will be needed.
- Scope of Work (SOW) document for Metro or Federal/State funded TDOT Projects (See Appendix 6.C and 6.D)

### 6.2.2. Erosion Prevention and Sediment Control Inspection (EPSCI) Service

This service is required for all projects under construction and should be acquired prior to the construction contractor. They should be under contract prior to the first pre-construction meeting (grading permit, NPDES permit, NES, departmental, etc.) on the Metro project schedule. For Metro funded projects, this service can be performed by the CEI, so the EPSCI SOW should be included in the CEI SOW. For Federal/State funded TDOT Projects, per the

TDOT Local Government Guidelines Manual (LGGM), the EPSCI shall be independent from the CEI Inspector and in a separate contract.

- Request is for an Architectural and Engineering (A/E) Service
- Contract term: End of Construction
- Select Background Check if access to Metro databases and/or services will be needed.
- Scope of Services document

### 6.2.3. Construction Contractor

All contracts will be solicited via ITB unless price negotiation is necessary.

- Request an Invitation to Bid (ITB) for low bid contracting.
- Request a Request for Proposal (RFP) to be able to negotiate the price.
- Contract term: End of Construction
- If RFP, Brief Scope of Work document
- Final Stamped Construction Plans and Specifications
- Bid Schedule Form
- Additionally, for TDOT projects in accordance with the latest LGGM:
  - Bid Book (Form 8-1)
  - Bid Advertisement Template (Form 8-3)
  - DBE Award Information (Form 8-5)
  - Any other required documents/forms needed for bid.

## 6.3. Bid Process, Evaluation, Contract Preparation and Award

The Purchasing Department will evaluate all bids from an ITB or RFP and prepare all contracts in accordance with Metro Procurement Regulations. If requested by the Purchasing Agent, the Project Manager assist the Purchasing Agent with reviewing and evaluating bids to assure that there are no irregularities or imbalances in the bid prices which would be detrimental to Metro in the administration of the Contract. The Project Manager or Engineer of Record will also assist with evaluating all aspects of the bid documents for conformance with bid requirements, including bid bond, appropriate signatures and corporate seals, Contractor Affidavit and Agreement, Certification by Contractor, Utility Contractors License, and all of the forms and requirements of the bid documents. Projects with state/federal funding have additional bid document requirements that must be evaluated.

The bid will also be checked against the Engineer's Estimate and project budget. If bids were submitted by RFP, bids may be negotiated. For projects with state/federal funding, all bid documents must be submitted to the TDOT for their approval prior to award by the Metro. If

the bids are over budget, improper, or not in the best interests of Metro, the recommendation may be to reject all bids.

If there are no issues with the bid, the Purchasing Agent will award the Contract to the lowest, most responsive bidder unless the bid was procured by RFP. Then the bids may be negotiated to ensure bid is within budget. Once the price is agreed upon, the Purchasing Agent will prepare and route the Contract for electronic signatures from the Department and Contractor. Upon contract execution, the Contractor will submit the Contract with all Bonds, Insurance Documents, and any other required documents. The Project Manager will file a copy of these documents in the electronic and hardcopy project files.

## 6.4. Pre-Construction Meeting, Project Walk-Through and Notice to Proceed

### **6.4.1.** Pre-Construction Meetings**.**

Following contract award and before any work is to begin on a project, several pre-construction meetings shall be held according to the project schedule. They include but are not limited to: Departmental, NPDES Grading and Residential Infill Stormwater Permits, NES Relocation (when required) and Railroad (when required).

Minutes of all meetings, including an attendance roster shall be kept by the CEI, and key decisions shall be fully documented.

- **Departmental Pre-Con.** The CEI will prepare for and conduct a pre-construction meeting. The Project Manager will arrange a time, location and send notification for the meeting, and is required to attend and assist as needed. The Contractor, ADA office representatives, Metro Project Manager, all railroad/utility owners, and any other departments involved in the construction shall be invited to this meeting. The meeting shall be conducted with a structured agenda to assure discussion of all aspects of the project including but not limited to:

    - anticipated date of Notice to Proceed,
    - Contractor's schedule and plan of operation,
    - Substantial Completion Dates,
    - required contract provisions,
    - any limitations in the areas where work can take place in the project due to unavailability of right-of-way or easements,
    - anticipated dates of possession of any parcels unavailable at the time of Notice to Proceed,
    - any special conditions of construction or protection on properties as a result of the acquisition settlement,

- proposed revisions to the staging or maintenance of traffic plans by the Contractor,
- environmental commitments if applicable,
- erosion control,
- traffic control/work zone safety,
- utility relocations,
- inspection,
- materials acceptance,
- independent quality assurance,
- quality control plans,
- certified payrolls,
- DBE/subcontractors, etc.

In preparation for discussions concerning conditions resulting from right-of-way settlements, the CEI and Project Manager shall review the Right-of-Way plans and settlement documents identifying parcels with special conditions.

- **NPDES Grading Permit and Residential Infill Stormwater Permit Pre-Con.** Grading Permits and Residential Infill Stormwater Permits are issued by the Metro Water Services (MWS) Stormwater Division. Once the permit is approved, a pre-construction meeting will be scheduled with the Design Consultant, Contractor and Project Manager. These meetings are held every 20 minutes at Metro Water Services 1607 County Hospital Road. The meeting will cover the project erosion prevention, sediment control, grading procedures, Metro codes, and other related issues. The certified EPSC professional (TDEC Level I) who will represent the project and perform the routine site inspections must attend the meeting. The project engineer and contractors should also attend. See the grading permit issuance flowchart (Exhibit 6.6) for pre-construction process schematic.
  All work associated with securing a Metro Grading Permit and/or Residential Infill Stormwater Permit shall be pursued and performed in accordance with the processes and requirements found in the Metro Stormwater Management Manual and Chapter 15.64 of the Metro Code.

  The most current information on the Grading Permit and Pre-Construction Meeting can be found at:
  https://www.nashville.gov/Water-Services/Developers/Stormwater-Review/Who-Needs-A-Grading-Permit.aspx

  Further related resources can be found at: https://www.nashville.gov/Water-Services/Developers/Stormwater-Review.aspx

Sites unsure if a need for permitting exists should contact Metro Water Services Development Review Division at the Metro One-Stop-Shop – Metro Office Building (800 2nd Ave. S.) – 615-862-7225 or MWS.ds@nashville.gov.

- **NES Relocation Pre-Con.** When an infrastructure project requires NES to relocate their lighting and electrical poles to another location outside of the ROW or to place lighting underground, NES will require Metro to have a pre-construction meeting prior to the start of construction to go over the lighting installation drawings and coordinate the work and NES inspections. For more information refer to the NES Electric Service Guidelines. The Project Manager will be responsible for ensuring all required parties are notified and attend the meeting.

- **Railroad Pre-Con.** Metro shall participate in any pre-construction meetings required by the railroad agency. Instructions for a railroad pre-construction meeting should be outlined in the guidelines to obtain a railroad crossing permit. The Project Manager will be responsible for ensuring all required parties are notified and attend the meeting.

### 6.4.2. Project Walk-through

A project walk-through will be scheduled during the preconstruction meeting. The Design Consultant (if necessary), Metro Project Manager, Inspector, contractor, and representatives from affected utility companies will walk the limits of the project to discuss construction methods, traffic control, utility coordination, coordination with adjacent projects, and potential issues or problem areas. Pre-construction photos should be taken during the walk-through.

### 6.4.3. Notice to Proceed

During the Departmental Pre-Construction Meeting or soon after all Pre-Construction Meetings have been completed, (and after Contracts have been fully executed), the Construction Engineer will issue the Notice to Proceed letter that starts construction work and time on the project. The Notice to Proceed may be delayed or may be Conditional if adequate right-of-way or permits have not been acquired, utility conflicts need to be resolved, or other conditions exist that could put Metro at risk for delay claims or could unnecessarily prolong the project.

# 7. SCHEDULE AND PROGRESS REPORTING

## 7.1. Metro Project Schedule

The Project Manager is responsible for maintaining the overall schedule for the entire project from project initiation to project closeout. The Contractor is responsible by Contract for completing all the required work within the specified duration of time as stated in the contract. This section provides direction for monitoring the Contractor's schedule.

## 7.2. Construction Schedule

The Contractor construction schedule shall be submitted at the pre-construction meeting, but no later than prior to the start of construction. It shall be in a form acceptable to the Project Manager and Metro and shall be updated monthly. The schedule is to represent the sequence in which the Contractor plans to perform work, showing the start and end dates of each work activity, including material ordering and delivery. The Contractor shall also complete a construction phasing plan using Metro's format. The phasing plan should coincide with the activities of the schedule. The Project Manager will use this to update the Metro Project Schedule.

Approval of the schedule submittal is essential to establishing an orderly progression of the work and an accurate progress monitoring program within the early phase of work. The essential elements necessary for submittal approval are:

- Completeness.
- Inclusion of all necessary Contract milestones, descriptions, and dates.
- Technical compliance with the Specifications.
- Activity descriptions, sequence, and durations that address identifiable portions of the work.

If the schedule submittal is not approved, it must be returned to the Contractor as soon as possible with an explanation of why the schedule was not approved. The Contractor must resubmit a revised schedule for approval addressing the issues that caused the rejection.

The monthly progress schedule updates submitted by the Contractor, if necessary, are not required to be approved, but are accepted if they are complete and conform to the technical requirements of the Specifications.

Minor revisions may be made to the updated schedule submitted with the monthly progress report. Minor revisions include minor logic changes that serve to shorten the

scheduled time to completion, activity description and duration changes. If the CEI considers the changes to the original schedule to be of a major nature, he may require the Contractor to submit the revised schedule for approval.

A complete revision is generally required when there is a significant re-sequencing of work activities, added work, and/or delays. A complete revision submittal includes all documents required for the initial schedule submittal and is subject to approval. Prior to approval of the revision, monthly progress reports are to be submitted based on the previously approved schedule.

If any revision demonstrates a completion date later than previously approved, the Contractor shall submit a recovery schedule to attain the approved completion date or provide in writing the justification for additional time. If determined that additional time is justified, a Change Order will be submitted for approval.

## 7.3. Monitoring/Evaluating Contractor Progress

Each project has a fixed "Notice to Proceed" date and an established number of calendar days to reach substantial completion for the project. The Contractor's progress shall be monitored during the term of the Contract. Progress of the work is monitored by tracking planned start and complete dates of activities and comparing them against the Contractor's actual start and complete dates.

The Project Manager and CEI will monitor the time elapsed and time remaining as well as makes determinations if any time has been added to the project due to weather, scope change, etc. This is noted at the monthly progress meetings as well as formally communicated to the Contractor in writing. Planned starts must be evaluated far enough in advance to ensure that the Contractor can mobilize manpower, material, and equipment in time to start the work before it effects the critical path.

The Contractor's progress should also be tracked by the Project Manager using a payout curve which tracks projected cash flow and/or percent complete. Deviations on the curve of the Contractor's actual earnings vs. planned earnings indicate schedule problems that must be evaluated.

For instances where the contractor does not complete work within the contracted time limits, it is possible that Metro will assess Liquidated Damages as allowed by the contract. The Liquidated Damages assessment will be within the Liquidated Damages limits found in the Contract.

### 7.3.2. Monthly Progress Meetings

To ensure that the project's quality, budget, and schedule remain on track, the Project Manager or Project Manager's representative will hold monthly progress meetings with the Contractor and other appropriate staff. In general, the following topics should be covered:

1. Project Safety
2. Project Quality Assurance and Quality Control (QA/QC)
3. Schedule
4. Requests for Information (RFI) reviews/discussions
5. Submittal Reviews
6. Change Management
7. Requests for Payment
8. Issues / Other Business
    a. Complaints
    b. Deficient Work
    c. Identification of Potential Risk Issues
    d. Contractor Concerns

The Project Manager or representative will prepare an agenda outlining as much of the information shown above prior to the progress meeting to reduce notetaking and opportunities for misunderstandings. Meeting minutes should be produced for each progress meeting and filed in the CFMS.

### 7.3.3. Progress Reports

Progress reports should be prepared weekly by the Project Manager or Project Manager's representative and submitted to Management at the end of each week. The progress reports should include the following information at a minimum:

1. Project Name
2. Project Scope
3. Budget
4. % Budget Used
5. Schedule
6. % Work Complete
7. % Contract Time Elapsed
8. Project Notes (issues, risk assessments, any pertinent information that needs to be conveyed to management about the project)

### 7.3.5. Construction Photos (Pre, During, Post)

Documentation of the project through photos is vitally important for use with dispute resolutions, pay application discrepancies and ultimately reduce risk exposure to Metro.

- **Pre-construction Photos.** Photographs of the project limits should be taken prior to the contractor mobilizing on-site and should thoroughly document pre-construction conditions. Photos should start at on side of the project and progress in an orderly fashion to the end of the project limits. Photos should include landmarks that can help with identifying the location of the pre-construction photos both during and after construction.

- **During Construction Photos.** Photographs of construction activities should be taken daily and included with the daily inspection report. The photos should document all construction activity for the day and should validate the daily activities for the project.

- **Post Construction Photos.** Once the project has been completed, post construction (as-built) photographs should be taken of the project and included with the project closeout documentation for the project. Photos should start at on side of the project and progress in an orderly fashion to the end of the project limits. Photos should include landmarks that can help with identifying the location of the as-built photos as they relate to pre-construction and during construction photographs.

## 7.4. Work Progress Control

The Contractor is responsible for completing the Contract within the specified time. Metro cannot direct work operations, and it must be clear that only guidance is being provided unless circumstances are such that specific action is necessary.

If evaluation of the Contractor's performance shows that a reasonable start of a work activity or activities cannot start on planned dates, Metro should notify the Contractor. If failure to start an activity that will delay the project completion and if such delay is within the control of the Contractor, Metro will encourage that the work be started.

After a work activity has started, Metro must assess progress for the activity. If it appears that the Contractor will not complete the activity within the planned duration, this must be formally brought to the Contractor's attention. Notification must be limited to observations of actual

progress vs. planned progress; the Contractor retains the responsibility for remedial measures necessary to achieve the planned finish date.

If a critical work activity falls behind planned progress such that the project completion will be delayed and the cause of the delay is **within** the Contractor's control, (not caused by Metro), the Contractor should take action to regain lost time. Metro should notify the Contractor of concerns of lack of progress and request the Contractor to submit a written remedial plan and revised schedule to correct the problem. The Contractor should also be reminded of the potential of liquidated damages to be accessed in accordance with the contract.

If the delay to a critical activity is not within the Contractor's control, it is essential that the cause of the delay be identified, the delay quantified, and a Change Order for additional time be allowed.

As progress proceeds past fifty (50) percent, Metro should review remaining work activities to assure that the Contractor has: (1) included all work activities, and (2) planned realistic durations for all remaining activities, including close-out requirements.

At substantial completion, since retainage is not allowed in Metro contracts, the Project Manager and CEI should review the remaining work to see if the remaining payments should be withheld for the completion of any outstanding work that is not on schedule.

# 8. PROJECT COMMUNICATIONS

## 8.1. General Correspondence

### 8.1.1. Outgoing Correspondence

Metro personnel shall be responsible for sending all official correspondence from NDOT to other Metro departments, Metro Council, Mayor's Office, other agencies, to the public and the media. All project correspondence shall be written in a concise, professional manner and in accordance with the format outlined by the Chief Engineer, Public Information Officer, NDOT Director, or their designated representative.

Official Metro letterhead (electronic or hard copy) shall be used for letters and memoranda. Signatures and initials may be electronic (standard copy of handwritten signature or dynamic with date and time stamp). All handwritten signatures shall be in "blue" ink.

Metro Letterhead may be given to consultants for use in creating documents for mass production on Metro's behalf. They shall create the content of the document(s) and submit them to Metro personnel for printing and distribution by US mail or FedEx.

### 8.1.2. In-coming Correspondence

Official documents received shall be stamped with the date received and name of who received it. Documents submitted for review and approval shall be stamped with the review/approval date and who it was reviewed/approved by. All correspondence received via mail shall be scanned, if not already in an electronic format. Project Managers shall file in chronological order all electronic and hard copy correspondence, including e-mails, phone logs, meeting notes, and agendas in the appropriate project folders on the network and in the file cabinets.

## 8.2. Daily/Monthly Reports

### 8.2.1. Daily Inspection Reports

The CEI shall maintain a project diary daily to document the daily activities and major events on the project during construction. The daily diary report shall contain the following as a minimum:

- Date
- Weather, amount of precipitation, temperature at morning, noon, evening, cloudy, clear, etc.
- Contractors on site

- Contractors' personnel (number and classification) on site
- Location and work performed by each contractor or subcontractor
- Hours Worked
- Type and amount of equipment on site (hours used or idle)
- Visitors to the project site
- Orders/directives given to the contractor
- Accidents/incidents on the project and any details such as police report number, fatalities, causes, time, etc. Obtain a copy of the police report for the project records whenever possible
- Unacceptable work or materials found
- Delays (type and length)
- Days charged, with explanation if not charged
- Any other details or issues that may affect the completion of the project or be cause for future disputes.

### 8.2.2. Field records

Shall be either written or electronic and shall be kept to specifically document each pay item in the contract. The field records shall contain the individual and cumulative quantities for progress payments including the dates, stations, locations, dimensions, and calculations for each payment.

### 8.2.3. Weekly Reports

The CEI will maintain a weekly digital photographic log of active work, significant features, and issues that arise. At the end of each week, the CEI will submit to the Metro Project Manger a report detailing the work accomplished during the week and the work scheduled for the following week. This report will list all expected lane closures including the dates, times and what lanes are to be closed. The Project Manager will update the project progress in CFMS weekly for reporting purposes.

### 8.2.4. Monthly Reports

At the end of each month, the Project Manager shall update the project schedule, ensure that all project information (financial and progress) in CFMS, and will update the project status according to Sections 8.5 and 8.6.

## 8.3. Meetings

Project meetings may be in person, via phone call, conference call or video call. The Project Manager shall setup and conduct all meetings with other Metro Departments and outside agencies unless indicated otherwise. The Project Manager or a designee shall take meeting

notes/minutes. If meeting notes/minutes are done by the designee, they shall be reviewed by the Project Manager for accuracy and completeness.

## 8.4. Agency/Utility Coordination Meetings

The Metro Project Manager will set times and places for these meetings. The CEI will prepare and distribute notices of meetings, prepare the agendas, provide all other meeting materials, and prepare and distribute detailed minutes of the meeting including documentation of the resolution of any issues. The Project Manager shall review the agenda, meeting materials and meeting minutes for accuracy and completeness prior to distribution.

## 8.5. To Public, Management, Other Departments, Council Members, Mayors Office, and Media

Project information provided to the public shall be reviewed by the Project Managers immediate supervisor, second line supervisor or Chief Engineer. When necessary, reviews may also be done by the Public Information Officer. The Project Manager shall provide monthly project status updates via email to Management unless requested more frequently. The updates shall summarize the work completed that month, any issues that need to be elevated, what work is planned to be done in the coming month, and updated budget and schedule information. Projects in construction shall be updated weekly and sent to the Public Information Officer for distribution in NDOT's weekly update to the Council Members. These updates shall summarize the work completed that week.

## 8.6. Project Webpages and Public Viewers

### 8.6.1. Project Webpages

All capital projects that are not part of a Program (i.e. Bridge, Culvert, Paving, Sidewalk, Bikeways, Traffic Calming, etc.) shall have their own webpage for public viewing. Project Managers shall ensure project webpages shall be updated at least monthly with pertinent project information (i.e., project details, phase, status, funding updates, timeline, council district, council member, photos, videos, renderings, typical section, conceptual layouts, etc.) See Exhibit 8.1 for webpage format and example layout.

### 8.6.2. Project Viewers

This includes but is not limited to the Capital Funds Management System (CFMS), Pavement Management System (PMS), Bridge Maintenance and Management System (BMMS), Culvert Maintenance and Management System (CMMS), Sidewalk Tracker, Bikeways Tracker, NashDigs, CityWorks, etc.

CFMS shall be the database of record for all NDOTCapital Projects. Program Coordinators and Project Managers are responsible for ensuring pertinent project data and location information are updated at least monthly (more frequently when necessary) in the necessary databases and are visible across all relevant viewers. All projects and project locations funded with Capital funds, in whole or in part, shall be displayed in the CFMS and the asset management system/GIS based tracker for each respective program. All funded but not completed projects in CFMS shall also be synced with and displayed in NashDigs. All capital funded work order locations shall be reflected as a stand-alone project or as a project location within a program in CFMS.

EXHIBIT 8.1 – Capital Improvement Project Webpage Format

## Project Title

## Project Limits: From Street to Street (X.XX miles)

**Council District XX:** Council Member Name

## Month Year Update

## Phase: [Design, ROW Acquisition, Bid, Construction]

Briefly summarize the project activities which occurred that month.

**Next month:** Briefly state the project activities anticipated for the current month.

## Project Description

Describe what the project will entail.

- Length: XX Linear feet (or miles)
- Cross-Section: XX foot travel lanes and X foot paved shoulder
- Estiamated Project Cost:

## Timeline

(For each timeline milestone, indicate the Month or Season Year (duration: XX months or weeks) estimated for that phase.)

- Conceptual Design:
- Deign (Plan Development):
- Right-of-Way Acquisition:
- Utility Coordination:
- Final plans:
- Advertisement:
- Bid Opening:
- Estimated Construction Start:
- Construction Duration: XX months or weeks
- Estimated Construction Completion: To be added after receipt of construction schedule.

For more information, please contact the Metro Project Manager at 615-862-XXXX.

# 9. RIGHT-OF-WAY PERMITS AND INSPECTIONS

## 9.1. Permit Management and Inspections

CityWorks Work Manager is used by all Metro Departments such as Codes, Metro Water, and Metro NDOT to manage all permits issued within Davidson County. The comprehensive workflow supported by the permitting system and the Metro GIS will help Metro staff to plan, approve, issue permits, track, and inspect work more effectively that is taking place within the Metro right-of-way. Metro Permit staff and Inspectors should follow the policies and procedures for issuing permits and performing inspections outlined in the Metro Permit Inspection Manual (See Appendix 9.A).

## 9.2. Work in Metro ROW

Anyone planning to work or have an event in Metro ROW are required to have a permit. The purpose of permits issued in the right-of-way is to regulate work done and activities performed so we can ensure they are performed safely and efficiently with minimal impact to the public. It is the responsibility of the Inspector to know all permit restrictions as identified by the permit and to inspect and confirm adherence to the restrictions and limits of each permit.

## 9.3. Types of ROW Permits, Approvals, Payments and Fees

The following list of permits and approvals, as applicable for the project, must be obtained from Metro NDOT, Metro Water Services or Metro Codes Administration/One-Stop-Shop prior to any event or construction activities can take place in the ROW. These permits and approvals may come with additional construction requirements that may not be included in the plans.

**NDOT Approvals:** **https://www.nashville.gov/Public-Works/Community-Beautification/Tree-Information/Planting-in-the-Right-of-Way.aspx**

- Tree/Landscape Planting Approval – All trees and landscapes planted in the ROW must get the approval of the NDOT Horticulturalist and Traffic Engineer by submitting an online Neighborhood Tree Planting Approval Projects Form. A tree or landscape plan must be submitted for review and approval prior to bidding of construction work. This All trees planted in the ROW will require an excavation permit and a three (3) year landscape maintenance agreement.

**Metro Stormwater Permits:** [https://www.nashville.gov/Water-Services/Developers/Stormwater-Review/Who-Needs-A-Grading-Permit.aspx](https://www.nashville.gov/Water-Services/Developers/Stormwater-Review/Who-Needs-A-Grading-Permit.aspx)

- Grading Permit - For any land disturbing activities, operation, or occurrence by which the existing site elevations are changed; or where any ground cover, natural or man-made, is removed; or any watercourse or body of water, either natural or man- made, is relocated on any site, thereby creating an unprotected area. This includes stripping, cutting, filling, stockpiling, or any combination thereof, and shall apply to the land in its cut or filled condition. Grading permits are necessary when grading will disturb more than 10,000 square feet of the project site.

**NDOTROW Permits:** [https://www.nashville.gov/Public-Works/Permits/Right-of-Way-Permits.aspx](https://www.nashville.gov/Public-Works/Permits/Right-of-Way-Permits.aspx)

- Pavement Assessment Permit – For cutting a street that has been paved within the last five (5) years.
- Trench Cut Permit - For excavation when the width is 6' or less.
- Surface Cut Permit - For excavation when the width is greater than 6'.
- Excavation Permit - For excavation that is less than 50' in length or 6 square yards.
- Lane Closure Permit - For closing a lane, bike lane or traffic for construction purposes or special events.
- Street Closure Permit - For closing a street temporarily for construction purposes or special events.
- Driveway Permit - For right of way activity relating to the maintenance or installation of a commercial or residential driveway.
- Sidewalk Closure Permit - For closing a sidewalk, bike path or shared-use/multi-purpose path for construction purposes or special events.
- Parking Loading Zone Permit - For parking in a loading zone for loading & unloading for more than time allotted by the Traffic & Parking Commission.
- Encroachment Permit - For any aerial, underground, or building (including awning, sign, canopy, fiber optic cable, etc.) that encroaches on metro right of way.
- Sidewalk Café Permit - For permits for downtown businesses to have sidewalk dining.
- Trailer/Dumpster Permit - For placing a trailer, dumpster, or storage units in the right of way.
- Permeant Street Closure Permit – For closing a street for an indefinite amount of time. (This is not a street abandonment.)
- Street Renaming Permit – For renaming an existing street.

**Metro Codes Administration Permits: https://www.nashville.gov/Codes-Administration/Construction-and-Permits.aspx**

- Building/Structure Moving Permit - For the moving of any building or structure where such necessitates the transportation of such building or structure in public rights-of-way or on public streets.
- Building/Structure Demolition Permit - For the destruction and/or removal of any building or structure.
- Blasting Permit – Required to perform any drilling or blasting of rock, earth, trees, etc., with any form of explosives
- Sign Permit - For the erection, construction, or alteration of any sign, billboard, awning, marquee, or similar structure on commercial property.
- Tree Removal Permit – Required whenever a tree or trees are to be removed and are greater than six (6") inches in diameter. This permit is issued by the Metro Codes Urban Forester.

**Permit Payments/Fees for High Impact Areas and all Other Areas**

Unless indicated otherwise, all Metro Permits will require a fee according to a payment schedule and impact area which the activity is located. Ordinance BL2016-235, as amended, establishes the boundaries for the new Right of Way (ROW) Permit High Impact Area map. (Exhibit 9.1) Fees for permits above can be found at:

- **NDOTROW Permit Fees:** https://www.nashville.gov/Public-Works/Permits.aspx
- **Building Codes Permits Fees:** https://www.nashville.gov/Codes-Administration/Construction-and-Permits/One-Stop-Shop.aspx
- **Stormwater Grading Permits Fees:** https://www.nashville.gov/Water-Services/Developers/Stormwater-Review/Applications-Forms.aspx

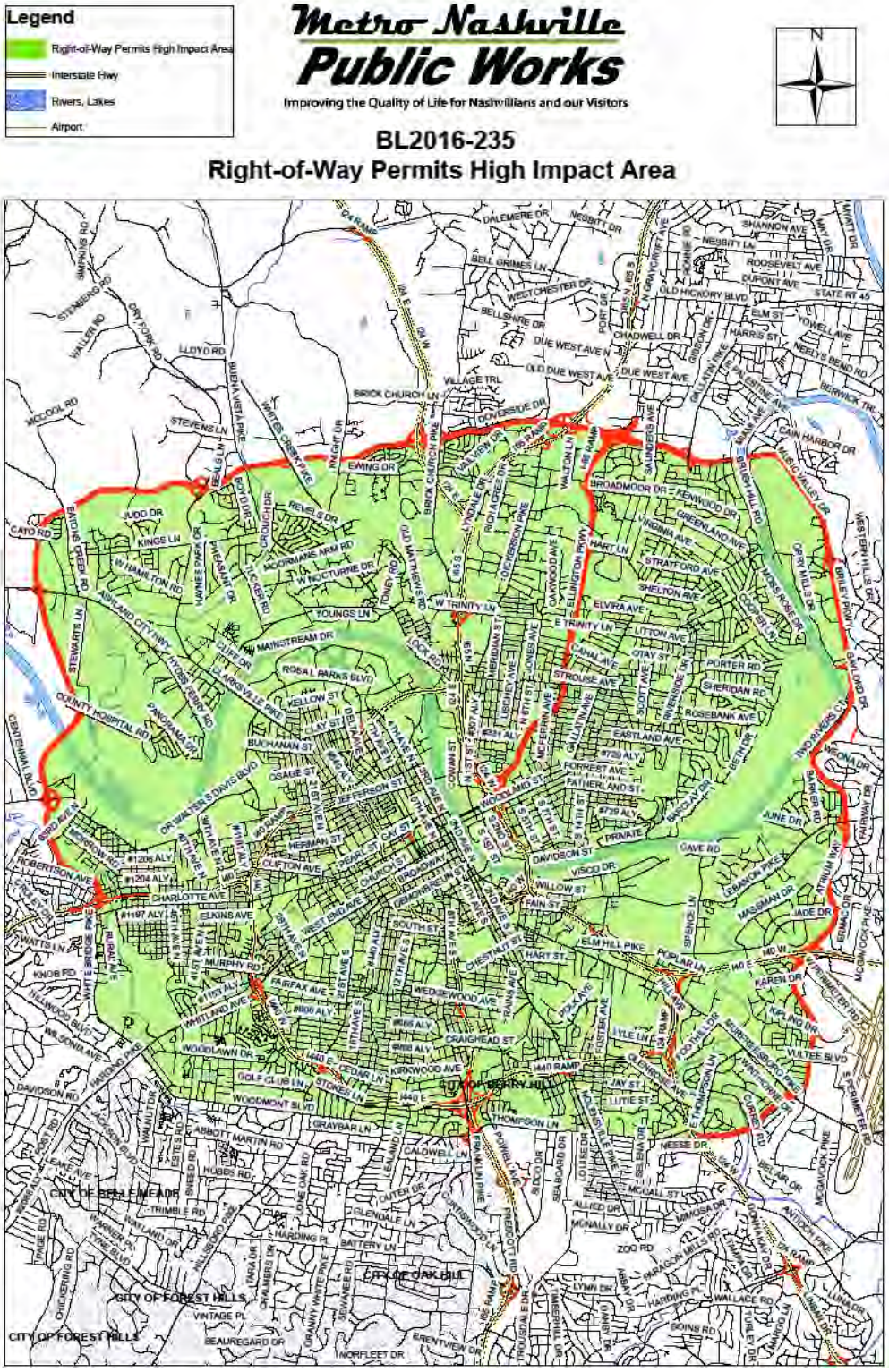

Legend
Right-of-Way Permits High Impact Area
Interstate Hwy
Rivers, Lakes
Airport
Metro Nashville
Public Works
Improving the Quality of Life for Nashvillians and our Visitors
N
BL2016-235
Right-of-Way Permits High Impact Area

EXHIBIT 9.1

## 9.4. Traffic Control and Safety Plans

Contractors must follow NDOT Engineering Standard Specifications and the safe traffic control practices outlined in the latest edition of the Manual for Uniform Traffic Control Devices (MUTCD). Inspectors should have a general understanding of the MUTCD and be able to articulate its requirements effectively.

## 9.5. Bicycle and Pedestrian Work Zone Safety Act – NDOT Regulations and Guidelines

Any construction activity or event resulting in the partial or complete blockage of a sidewalk, bike lane or other public bicycle or pedestrian path shall comply with the Bicycle and Pedestrian Work Zone Safety Act – NDOT Regulations and Guidelines. (Appendix 9.B)

## 9.6. Low Impact Utility Markings Policy

All Contractors, Utility Companies, Cable Companies and any other entities whose work requires location marks, will be required to follow the guidelines of the Low Impact Utility Markings Policy (Appendix 9.C) to ensure the best environmental and safety practices, reduce unnecessary and unsightly one-call locate marks in the right-of-way, and reduce the length of time they remain on the pavement and sidewalk after the completion of the job.

## 9.7. Uniform Requirements for Traffic and Police Officers Working at Permitted ROW Sites

NDOT permits may require the use of off duty sworn peace officers, as defined, and specified in Tenn. Code Ann.§§ 62-35-102(18) and 62-35-103(a)(15)(B), for traffic control where appropriate. Officers must be in uniform. Officers from jurisdictions other than the Metropolitan Police Department must follow the requirements of Tenn. Code Ann. § 62-35-141 and all other applicable statutes, rules, and regulations. When a permit issued by NDOT requires an off-duty police officer, the officer must be

present at the work site and actively engaged in the control of traffic in accordance with the Uniform Requirements for Traffic and Police Officers Working at Permitted ROW Sites Policy. (Appendix 9.D)

## 9.8. ROW Closure Permits Policy

Any working that requires temporary closures in the right of way such as sidewalks, alleys, streets or any other public right of way, including blocking permits for trailers and dumpsters (Ref. Chapter 13.20 of the Excavation and Obstructions Code) shall comply with the ROW Closure Permits Policy. (Appendix 9.E)

## 9.9. Utility Cut Guidelines and Specifications

All excavation permits will to the Utility Cut Guidelines and Specifications. (Appendix 9.F)

# 10. UTILITY COORDINATION

## 10.1. Utility Notifications, Coordination and Meetings

### 10.1.1. Utility Notifications/Coordination

During the planning and development phases of any roadway project, it is advisable to be in early contact with the utility companies that will be affected by a project. Time and money can be saved with advanced coordination and planning regarding utility facilities. Contacting utility companies early serves several purposes. It provides the Project Manager time to assure the contact information is correct, and it allows the utilities time to plan and budget for the project. The design consultant will assist the Project Manager in preparing the utility coordination notification letters. The Project Manager will be responsible for printing the letters on Metro letterhead and sending them out to the utility companies. See Appendix 10.A for an example of the Preliminary Plans and Utility Review Notification.

### 10.1.2. Utility Coordination Meetings

During the construction phase, the Project Manager and CEI shall work together on all utility coordination meetings.

- **Prior to the Bid:** The Metro Project Manager will set times and places for the utility coordination meetings and will lead those meetings. The CEI will attend utility coordination meetings, assist the Department and their Design Team with utility coordination issues associated with construction, and will review utility relocation concerns along with the Project Manager and Design Team to resolve issues identified on the plans or site visits.

- **During Construction:** The Metro Project Manager will set times and places for weekly utility coordination meetings. Discussion should include recent progress, upcoming events in the schedule, and project-related problems or roadblocks. The Project Manager or CEI will prepare and distribute notices of meetings. The CEI shall prepare the agendas, provide all other meeting materials, and prepare and distribute detailed meeting minutes of the meeting including documentation of the resolution of any issues; verify that utilities are in accordance with the plans; coordinate with utilities and contractors to resolve conflicts; assist the utilities, design firms, and Metro with issues; and help streamline the process to keep construction moving along smoothly.

- **Relocations:** Coordination and scheduling with utilities is a critical component of construction and must be maintained throughout the construction term. The individual utility companies will be responsible for providing the QA/QC acceptance of their respective relocations and installations. The CEI will verify that relocations are done in proper locations in accordance with the plans and not in conflict with proposed roadway elements or other Metro facilities.

**For Federal/State projects**, Metro must contact the TDOT Regional Utility Coordinator for Davidson County utility information. Early communication with the TDOT Region III Utility Coordinator will help avoid mistakes, and, since the TDOT Region III Utility Coordinator is responsible for the review and approval of the project utility certification, delays can be avoided by frequently communicating the project progress and required documentation.

The following steps are outlined in the TDOT Local Programs Guidance Manual. Refer to Chapter 6.2 of that manual for more details.

1. Meet with TDOT Region III Utility Coordinator.
2. Issue ROW Plans to Utilities. Utilities have 120 days to review and submit utility relocation plans.
3. Utilities submit responses for relocation plans.
4. Metro reviews and approves utility responses.
5. If Utility is on State ROW or is due compensation, then refer to the Local Programs Guidance Manual.
6. Metro authorizes Utility to begin work.
7. Various highway projects require the adjustment of utility facilities to accommodate the activities of the highway contractor as well as meet the physical requirements to improve the section of the highway. Utility relocation work can be performed as part of the contract or prior to start of construction on the project. In either case, adequate documentation shall be maintained. In various circumstances the appropriate utility may be reimbursed for expenses incurred for the relocation. Reimbursement will be determined before utility work begins.
8. In the case that a separate Utility Conference is necessary due to the magnitude of utility work related to the contract, the following TDOT documents will be required:

    - Utility Conference Notice (TDOT Form 8-10c)
    - Utility Conference Minutes (TDOT Form 8-11c)
    - Utility Conference Sign-in Sheet (TDOT Form 8-12)

## 10.2. Utility Relocation Plan Reviews

The utility shall submit its proposed relocation plan to Metro by the date specified in the notification letter. A complete submittal would include:

- Estimate of construction cost
- Percentage of facilities located on private easements
- Estimate of any proposed betterment costs
- Request for method by which the relocation work to be performed (i.e., percent private relocation contract or move in relocation contract and what the utility's cost will be in the contract)

**For Federal/State Projects**, refer to Section 6.2.4 of the TDOT Local Programs Guidance Manual for more details.

## 10.3. Utility Relocation Payments

**Relocations Within Existing ROW.** Metro does not pay for any utility relocations within Metro ROW. If a project requires a utility to relocate within an existing ROW, it is the responsibility of that utility to move at their own expense.

**Relocations from Existing ROW to Outside of the ROW.** If a project requires a utility to move outside of the existing ROW, then Metro Legal has advised that the utility should pay for the removal, but the project pay for the installation in the new location outside Metro ROW (even if they are relocating to Metro Property) and possibly provide the utility an access and maintenance easement.

**Relocations from of Above Ground to Underground.** If a project requires a utility that is above ground to relocate within or outside of the ROW and place the utility underground, Metro Legal has advised that the utility should pay for the removal, but the project pay for the installation of the utility underground.

**For Federal/State Projects**, refer to TDOT ROW Office for Utilities Resources, and TCA Chapter 86 for relocation eligibility.

# 11. DRAWINGS AND SUBMITTALS

The construction industry knows and understands that to expect a construction project to be built without issues arising in the field which cause deviations from the construction plans is unrealistic. Although, design engineers use the best information they have to analyze data, design and develop a set of plans, they are not omniscient. There are many anomalies that can arise during construction such as unforeseen site conditions, utility conflicts, changes in the geology and existing conditions. So virtually every project should expect changes. Only the construction engineer can truly determine the adequacy of project designs and respond to needed changes.

## 11.1. Contract Drawings and Revisions

**Contract Drawings.** The Project Manager shall ensure that the CEI and Contractor have the most current copy of the construction plans, specifications, and addenda prior to the start of construction. Other entities and agencies (governmental agencies, public utilities, railroads, other inspection agencies, and other Contractors interfacing with the work) may also need copies of the plans and specifications. The Project Manager in coordination with the CEI, is responsible for maintaining a complete set of Contract Drawings with current revisions of each drawing, and a log showing each drawing with all revisions.

**Plan Revisions.** When an error, omission, correction, or additional detail is needed to the plans, the Contractor shall submit a Plans Revision Request to the CEI and Project Manager for concurrence. Upon receipt of the request, the Project Manager will work with the Design Consultant and "Engineer of Record" to coordinate any plan changes that need to be made. The Design Consultant shall, without additional compensation, correct or revise any errors, deficiencies, or incomplete, inaccurate, or defective work in its designs, drawings, specifications, and other services. Defective work includes, but is not limited to, erroneous tabulations, incomplete surveys, maps, or reports, and incorrectly assembled reports, plans, specifications, or similar documents caused by the Design Consultant's error or omission.

Plans revisions shall be documented by the following information:

1. Revision Number – Revisions shall be numbered consecutively throughout the life of the project.
2. Revision Date – The effective date of the revision.
3. Brief Description – A brief description as to the basis of the revision.

Whenever revisions to plans and specifications are issued, the Project Manager shall submit a Change Order to the contractor to incorporate the revision into the contract. The Project Manager is also responsible for ensuring that the CEI and Contractor receives all revisions to

the Contract Drawings issued after Notice of Award. Superseded revisions of Contract Drawings are retained for record purposes separately from the current Contract Drawings.

**For Federal/State projects,** additional approvals from TDOT Local Programs Development Office are required for change orders and plan revisions. See Section 8.2.25 of the TDOT LGGM.

## 11.2. Shop Drawings, Working Drawings

**Working Drawings.** When additional details and dimensions are needed, the contractor shall prepare working drawings and submit them to the CEI for review, comment, and forwarding to Metro Project Manager for distribution to "Engineer of Record" for approval. Working drawings involved in construction over or under railroad tracks will require approval of the railroad company before approval is granted by the Engineer of Record. No work shall be started until these plans are approved by Metro and the Chief Engineer of the railroad company. Approval of these plans will not relieve the contractor from liability. The above also applies in connection with the installation of pipes, culverts, etc. adjacent to or under railroad tracks. The cost of preparation of working drawings will not be paid for separately but shall be included in the prices of the respective contract items involved. All costs for changes to working drawings and shop drawings shall be the contractor's expense.

**Shop Drawings.** Shop drawings for all types of structures shall be submitted by, or on behalf of the contractor, to the CEI, unless noted otherwise in plans or specifications, for handling with the checking agency and for distribution. Proof of appropriate fabricator certification (as required by the specifications for the type of structure to be fabricated) shall be submitted along with the shop drawings.

CEI will submit all shop drawings to the Metro Project Manager with Contractor's comments and recommendations regarding submittals requesting changes in design or specifications, as appropriate. The Metro Project Manager will then submit shop drawings to the appropriate approving party.

When applicable, the contractor is required to submit shop drawings for the following items:

- Structural steel
- Metal bridge rails
- Bearing devices (except for elastomeric bearing pads)
- Bridge deck drains (if not fabricated according to standard drawings)
- Navigation lighting support brackets
- Precast Prestressed Concrete Beams

- Precast Prestressed Concrete Deck Panels
- Precast Reinforced Concrete Beams
- Precast Reinforced Concrete Box Culverts
- Post-tensioned Concrete, Roadway Expansion Devices
- Steel Stay-In-Place forms
- Energy Attenuation Devices
- Overhead and Cantilever Sign Structures
- Strain Poles
- Street Lighting Poles
- High Mast Poles with Accompanying Lowering Devices
- Photometrics
- Cofferdams and
- Any other items when indicated on plans.

Also required are erection drawings for steel structures, drawings of falsework, bracing, cofferdams, sheeting, bending of reinforcing steel and other supplementary plans called for by the Engineer of Record.

## 11.3. Material Submittals

Material submittals must comply in number, style, and format with the requirements of the Contract, Plans and Specifications. Each submittal must be logged in a submittal register by the CEI for the Metro Project Manager and must be reviewed and returned with appropriate comments within the contractually specified period. The submittal log shall include, at a minimum, the date of each submittal, the date of any resubmittal, the date of any approval or rejection and the reason for the approval or rejection. All technical submittals will follow the routing sequence depicted in Exhibits 4.1 and 4.2. The Project Manager is responsible for tracking the status of reviews. The Project Manager will update the submittal register when the review of the Contractor's technical information is returned from the Design Engineer and will transmit the information back to the Contractor.

Submittals are to be made and approved prior to the commencement of work. Any work that the Contractor attempts to perform without the approval of required shop drawings must be strongly discouraged. The Project Manager and/or CEI must formally notify the Contractor that these actions are undesirable and are at the Contractor's risk. The CEI must also warn the Contractor that payment may not be made for work performed without approved submissions, and if remedial work is required, it will be at the expense of the Contractor. If, in the judgment of the CEI or Project Manager, the work is not proceeding in accordance with the Contract, a stop work order can be issued.

The CEI may elect to review and approve specific submittals, except shop or working drawings which are of a design or performance nature. The Design Engineer/Engineer of Record reviews

and approves submittals for compliance with the technical requirements. The CEI is responsible for ensuring the Contractor's compliance with the submittal and review process and that work is completed in accordance with approved submittals.

# 12. MATERIALS AND TESTS

The materials and testing processes and procedures identified in the latest edition of the TDOT Standard Specifications shall be used for all construction materials unless stated otherwise.

The quality of materials on the project and tests performed must conform to all applicable ASTM and AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing, most current edition. All materials used on the project must have test reports, material certifications and/or field testing by certified personnel to document that the material meets appropriate specifications. Testing shall be in accordance with a FHWA approved testing program which includes procedures for the sampling, testing and acceptance of materials and products. The source for each type of material must be on TDOT's Qualified Product List or Producer Supply List.

## 12.1. Material Certifications

The intent of material certifications and test reports are to assure that the quality of all materials incorporated into the project is in conformance with the plans and specifications.

The required forms for material certifications/test reports are located at https://www.tn.gov/tdot/materials-and-tests/field-operations/forms.html. Each form has attached an example completed form. All Material Certifications/Test Reports shall be recorded on the Test Report Totals form. There shall be a Test Report Totals form per item that requires certification/test reports for materials used.

Materials accepted by certification require a T-2 form attached to the certification. The T-2 (DT-0044) form (TDOT Local Programs Form 8-31) is the Contractor Material Certification and/or Sampling & Testing Record. This form is to be completed by the Contractor and approved by the CEI. Material Certifications shall be date appropriate according to the date the material was used. Materials not accepted on certification shall have daily reports documenting the actual test results.

Estimated item quantities shall not be paid without the proper material certification on file in the appropriate project file. Item payment shall be withheld until the proper approved material certification is in hand.

At the completion of the project, the CEI must complete and submit a project material certification to the project file. This certification must be based on an audit of the project records according to a certification check list stating that:

"The results of the test on acceptance samples indicate that the materials incorporated in the construction work, and the construction operations controlled by sampling and testing, were in conformity with the plans and specifications; and such results compare favorably with the results of the independent assurance sampling and testing. Exceptions to the plans and specifications are explained in the attachment."

The CEI shall document all failing material test and the corrective actions taken on the Material and Tests Certification (DT-1696) with supplement form.

## 12.2. Mix Designs

Asphalt and concrete mix designs shall meet TDOT specifications. Asphalt and concrete mix designs shall be approved by Headquarters Materials and Tests as outlined in the TDOT Standard Specifications 501 Portland Cement Concrete Pavement and SOP 3-4 (Asphalt). The contractor shall be advised to submit his asphalt and concrete mix designs as early as possible so as to not delay the project (14 calendar days prior to placement).

## 12.3. Acceptance Tests

Acceptance samples and tests are the samples and tests used for determining the quality and acceptability of the material and workmanship which have been or are being incorporated in the project. The results of these tests are to be used to determine conformance to contract documents.

The CEI shall conduct Acceptance Sampling and Testing in accordance with TDOT SOP 1-1. A representative from TDOT Regional Materials & Tests shall conduct all verification and independent assurance testing for the local project in accordance with TDOT Standard Operating Procedure (SOP).

Materials delivered to the project site used in work shall comply with Metro and TDOT Specifications, TDOT Qualified Products List or other contract documents when Metro/TDOT specifications are used. The Buy America requirements in Special Provision 106A regarding iron and steel products shall be applicable. Progress payments should not be made on an item if there are insufficient test data for that item.

## 12.4. Verification Tests

Verification samples and tests are those used for validating the quality of a product which is being incorporated into the project. All Verification Sampling and Testing shall be conducted by an AASHTO Certified Testing Lab for Metro projects, and by TDOT for State/Federal projects in accordance with TDOT SOP 1-1. The CEI shall notify the testing lab or TDOT Regional Materials Supervisor at least 72 hours prior to the start of work requiring verification.

## 12.5. Assurance Tests

Independent assurance samples and tests are used for the purpose of making checks on the reliability of the results obtained in acceptance sampling and testing. An independent assurance technician will be responsible for observing the acceptance technician conduct the tests to assure that the proper techniques and procedures are followed.

All Independent Assurance Sampling and Testing shall be conducted by an AASHTO Certified Testing Lab for Metro projects, and by TDOT for State/Federal projects in accordance with TDOT SOP 1-2. The CEI shall notify the testing lab or TDOT Regional Materials Supervisor at least 72 hours prior to the start of work requiring Independent Assurance testing.

Independent assurance sampling shall be conducted at the minimum frequency established in TDOT SOP 1-2. A prompt comparison of acceptance test results with independent assurance test results will be made by the TDOT representative. This comparison must be documented in the project records. If the comparison indicates a problem either with the materials or with the testing methods, action must be taken immediately to resolve the problem.

# 13. PROJECT INSPECTION

The Construction Engineering Inspector (CEI) consultant or Metro Project Inspection Staff shall serve as Metro's representative in the field, performing inspection from the beginning to the completion of projects. They will ensure projects are constructed in accordance with the plans and specifications, and ensure the contractors adhere to the requirements of the environmental and construction permits, and efficiently manage the construction and maintenance of public facilities on Metro owned/leased property or within existing Metro Right-Of-Way (ROW) or within future ROW and/or associated features. The goal of Metro and the CEI is to administer the contract in a highly professional manner, conducive of a cooperative relationship between the CEI, Contractors, Metro, and to ensure the work is completed on budget and on schedule with a minimum inconvenience and maximum safety to the public.

The CEI services will also include using GIS, cost estimating, data collection, database management, web pages updates, financial reporting, project scheduling, field inspections and audits, invoices/pay request review and approval for funded projects and other services as needed for project/program management and oversite purposes.

The CEI shall ensure that all construction work shall conform to the current federal, state and Metro Standards, Specifications, Standard Drawings, and any other applicable requirements. All work and supporting documentation are to meet the requirements of the TDOT Local Government Guidelines for the Management of Federal and State Funded Transportation Projects and any other requirements incorporated by reference in that document, as well as all requirements and regulations associated with Federal Emergency Management Agency (FEMA) reimbursement programs or other applicable State/Federal programs. Documents shall be submitted in formats that conform to Metro standards and can be easily incorporated into Metro's project management system, unless otherwise required by federal or state requirements.

## 13.1. Daily Inspection and Reporting

CEI shall maintain a project diary daily to document the daily activities and major events on the project. The daily diary report shall contain the following as a minimum:

- Date
- Weather, amount of precipitation, temperature at morning, noon, evening, cloudy, clear, etc.
- Contractors on site
- Contractors' personnel (number and classification) on site
- Location and work performed by each contractor or subcontractor
- Hours Worked
- Type and amount of equipment on site (hours used or idle)
- Visitors to the project site
- Orders/directives given to the contractor

- Accidents/incidents on the project and any details such as police report number, fatalities, causes, time, etc. Obtain a copy of the police report for the project records whenever possible
- Unacceptable work or materials found
- Delays (type and length)
- Days charged, with explanation if not charged
- Any other details or issues that may affect the completion of the project or be cause for future disputes.

In addition to the daily diary, field records, either written or electronic, shall be kept to specifically document each pay item in the contract. The field records shall contain the individual and cumulative quantities for progress payments including the dates, stations, locations, dimensions, and calculations for each payment.

The CEI will maintain a digital photographic log of active work, significant features, and issues that arise such as deficiencies in MOT (Ministry of Transportation), erosion control, etc. At the end of each week, the CEI will submit to the Project Manager a report detailing the work accomplished during the week and the work scheduled for the following week. This report will list all expected lane closures including the dates, times and what lanes are to be closed.

## 13.2. Erosion Prevention and Sediment Control (EPSC) Inspections

Nashville is a National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) that is managed by Metro Water Services Stormwater Division and regulated by the Tennessee Department of Environment and Conservation (TDEC). To comply with state regulations, Metro Codes issued the Illicit Discharge Ordinance (Metro Code 15.64.205--Non-Stormwater Discharges) making environmentally hazardous dumping illegal and **violators subject to a fine.**

Metro Water Services has also developed appropriate plans and guidelines to meet the requirements of the MS4 Permit including a Stormwater Management Manual. All projects shall comply with the requirements of the MS4 Permit and Stormwater Management Manual (SWMM).

The CEI shall serve as the Department's Erosion Prevention and Sediment Control (EPSC) Professional for the construction site and will be responsible for performing all EPSC inspections in accordance with the MS4 Permit and SWMM. The CEI shall conduct routine twice weekly project inspections and document the findings to assure compliance with the project's environmental permits and the Storm Water Pollution Prevention Plan (SWPPP). During these inspections, the CEI will inspect erosion control items for conformance to the plans as well as effectiveness in the field, and document findings on the appropriate inspection forms, as required by the SWPPP.

If the Contractor has its own EPSC Professional for the project, CEI shall conduct monthly QA/QC inspections of their Consultant's EPSC inspection and documentation procedures.

#### 13.2.1. By Metro Stormwater Compliance

Grading and Residential Infill Permit EPSC inspections shall be performed by Grading Permittee representatives in accordance with provisions set forth in the Metro Stormwater Management Manual for Stormwater Permittees. Metro Water Services Stormwater inspectors routinely/periodically inspect permit sites for EPSC compliance, with enforcement action being initiated as noncompliance circumstances warrant.

Non-permitted sites should install any needed EPSC to preclude work-related material (soil, contaminated pit pump water, mud to street, etc.) from leaving the work site area. Sites found to be losing material from a work site property – even if a Grading Permit or Residential Infill Permit was not required – may be subject to enforcement action and/or EPSC installation requirements.

#### 13.2.1. By Independent Project Inspector

For Metro projects, the EPSC inspections may be performed by a separate inspector on the CEI team unless stated otherwise in the MS4 Permit and SWMM.

For locally managed federal/state TDOT projects, an independent EPSC inspector be hired or assigned as recommended in the TDOT Local Programs Local Government Guidelines Manual (LGGM). The EPSC Inspector shall follow all the policies and procedures for EPSC inspections outlined the LGGM in addition to Metro's MS4 Permit and SWMM.

### 13.3. Development Inspections

When new public roads are being constructed by developers, NDOT uses in-house inspectors to confirm compliance with applicable standards, specifications, and approved plans. On large scale projects consultants may be used.

**Applicable Specifications and Standard Drawings**

A. All city, county, state and federal laws, ordinances or regulations relating to the work to be performed.

B. The following specifications of the NDOT shall apply and can be found at: https://www.nashville.gov/Public-Works/Developers/Details-and-Specifications.aspx.
**02225 Structures for Earthwork and Pipes**

**02500 Paving and Surfacing**

**02520 Cement Concrete Curb, Gutter, and Combined Curb and Gutter**

**02522 Cement Concrete Sidewalks, Driveways, and Median Pavement**

**02523 Detectable Warnings**

**02720 Storm Sewers and Drain Systems**

**330523 Guidelines for Horizontal Directional Borings**

C. NDOT Standard Drawings ST-series, available online at: https://www.nashville.gov/Public-Works/Developers/Details-and-Specifications.aspx.

D. Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction, latest edition.

E. Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction, latest edition, technical specification only, shall apply and become a part of these specifications whenever these specifications do not adequately cover the work to be done. In the event there is a conflict between these specifications and TDOT Specifications, NDOT specifications shall govern, unless the construction is on a state route.

## Roadway Inspection

Prior to any project receiving a Grading Permit, NDOT requires both the developer and general contractor to read and sign the Development Services Pre-construction Agreement. (Appendix 13.A) This form provides the basic inspection procedures.

## Bridges, Culverts, and Structures

On projects where bridges, culverts, or structures are to be constructed, the current NDOT Bridge Consultant will perform the inspections. On these projects an additional precon form is required to be read and signed by both the owner and general contractor prior to NDOTsigning off on the Grading Permit.

## Project Acceptance and Closeout

Prior to project being accepted form maintenance, final inspections are made. Below is a checklist of items to be inspected.

- ☐ Curb inlets and gutter flow lines have been cleared of mud, dirt, and gravel.
- ☐ All curb ramps must have ADA detectable warning mats.
- ☐ Sidewalks, curbs, and ramps must be ADA compliant and free from defects and cracks.

- The developer's surveyor has field located and marked all property monuments as required by the Subdivision Regulations.
- Topsoil is in and grass planted between the curb and sidewalks.
- Handrails where necessary have been mounted on sidewalks.
- Street name signs, stop signs, Dead End signs, and others have been installed with high intensity reflective backgrounds using size and colors meeting MUTCD specifications.
- Box culverts, walls, and bridges must have been inspected and approved by the NDOT bridge engineers.
- All slopes should be properly stabilized.
- Pavements are inspected for failures including potholes and cracks.
- Utility casting heights must be flush with the street.
- Temporary turnarounds and associated signage are installed.
- Offsite improvements such as turn lanes and traffic signals must be installed per approved plans.

## 13.4. Participation Agreement (PA) Inspections

When Metro enters into a participation agreement with developer and contributes funds towards the construction of public infrastructure, that developer essentially has become Metro's contractor and are subject to not only complying with the terms of the PA, but they must also comply with guideline, policies and procedures outlined in this Construction Management Manual.

For PA projects, an independent CEI shall be hire or assigned to ensure all the infrastructure is being constructed in accordance to plans and specifications before the infrastructure is accepted by Metro as an asset for maintenance.

## 13.5. ADA Inspections and Certifications

NDOT Inspectors monitor the projects in the public right- of- way and new projects that will become public right-of-way for ADA compliance. Items inspected are typically handicap ramps, sidewalks, detectable warnings, handrails, and push buttons at pedestrian crossings. Metro's ADA Construction-Rehab Compliance requirements can be found at https://www.nashville.gov/General-Services/ADA-Compliance/Construction-Rehab-Compliance-Review.aspx

### 13.5.1. In the ROW

All projects must meet Metro's ADA requirements. ADA inspections and Certifications within Metro ROW shall conform to PROWAG requirements.

For projects receiving federal grant funds, all ADA regulations of the funding agency must also be met.

### 13.5.2. Greenways and Trails

All greenway projects must meet Metro's ADA requirements where a sidewalk is constructed, or a greenway intersects with a sidewalk. This includes cross slopes, sidewalk ramps, trail ramps, handrails, warning strips, signalized crossings, handicap parking spaces, drinking fountains, trailhead signage, etc. This infrastructure is inspected and approved by Metro's ADA inspector.

For projects receiving federal grant funds, all ADA regulations of the funding agency must also be met.

### 13.5.3. Metro Property Outside the ROW

All projects must meet Metro's ADA requirements. ADA inspections and Certifications within Metro ROW shall conform to ADAAG requirements.

### 13.5.4. Development/Private Property

NDOT has established standard guidelines in accordance with ADAAG requirements for the inspection of sidewalks and ramps as shown in the Curb Ramp and Sidewalk Inspection Procedures (Appendix 13.B).

## 13.6. Project Issues

When project issues arise during construction, the CEI shall immediately notify the Project Manager. Although the CEI is not charged with the role of safety regulator, they shall notify the contractor immediately when safety issues or deficiencies are identified and ensure they are corrected. Imminent safety issues shall be corrected by the Contractor before work proceeds in the affected area. Metro will have the final word regarding challenges of CEI authority by the contractor or decisions made by the CEI regarding the work. All project issues and their resolutions shall be documented in the daily inspection reports and monthly project progress meetings notes.

# 14. CHANGES AND CLAIMS

All Contractor changes and claims, including requests for an extension of time, shall be initiated in writing, and submitted to the CEI and Project Manager. Such changes and claims shall be submitted no later than ten (10) calendar days after the event, or the first appearance of the circumstances causing the change or claim, and it shall state in detail all known facts and circumstances supporting the change or claim.

## 14.1. Time Changes

Changes to the Contract or delays to the work not caused by the Contractor may affect controlling work activities and thereby cause a delay in achieving Contract completion or an interim completion milestone. The actual impact of changed work or delays on the Contract milestones is analyzed by the Construction Engineer. The Contractor and CEI are responsible for taking all the actions necessary to minimize the impact of changed work on the schedule. Changes to the Contract Time must be approved by the Board of Commissioners in a Supplemental Agreement or Change Order.

## 14.2. Field Authorizations

Anytime during the construction phase of a project there is a change in the scope of work and/or construction cost, the CEI will fill out and process the field authorization form. The Project Manager must approve all field authorizations prior to performance of work. Field authorizations shall be classified as one of the following:

**Class I (In Scope) –** Any in scope change that does not exceed the field allowances.

**Class II (Out of Scope)** - Any change that is considered out of scope or exceeds in scope field allowances. Project Manager must approve prior to performance of work. This would also require a change authorization.

**Class III (Urgent) –** This is for a delay in progress that could be financially detrimental to Metro (i.e., crews and equipment on site being held up due to an overrun on an item such as gravel, pavement, remobilization, etc.).

**Class IV (Emergency) –** This is defined as any needed action that if not performed could result in jeopardizing the safety of the public or result in property damage.

## 14.3. Change Orders

When changes or sum of field authorizations occur that equal field allowances a change authorization shall be generated by the CEI for approval by the Project Manager.

| FIELD ALLOWANCE THRESHOLDS | |
|---|---|
| **Original Contract Amount** | **Allowable Field Allowance** |
| 0 - $1,000,000 | $10,000 or 2.5% of contract amount, whichever is greater |
| $1,000,000 - $2,000,000 | $25,000 |
| $2,000,000 or greater | 1.25% of contract amount |

If the change requires an increase in funds, it shall be taken out of the project contingency. All change orders involving an increase/decrease to the contract price or scope shall require approval from Metro Finance Procurement Department.

When the change order is approved, the Project Manager shall request a notice of correction to the purchase order to increase/decrease it by the change order amount. The Department's Finance Section will send a copy to the Project Manager to be stored in the project files.

## 14.4. Contract Changes

The contract amount shall not be modified except as provided in the contract. In the event the Contract Price is adjusted by Change Orders executed by the Contractor, the penal sum of both the performance bond and the payment bond shall be deemed adjusted by like amount.

## 14.5. Claims

Unsolicited proposals from the Contractor could represent potential claims against the Contract wherein the Contractor believes performed work has not been included in the Contract scope and additional compensation is due. The CEI is responsible for the review and analysis of the Contractor's claim to determine if it is clear and substantiated with valid documentation.

If the Contractor provides notification of intent to file a claim, but does not define the basis of the claim, the CEI or Project Manager must request the Contractor to provide such additional information and documentation as may be necessary to adequately present a proposal having merit and suitability for processing.

The CEI will prepare an evaluation and estimate of the Contractor's substantiated proposal to make a recommendation for approval or denial of the proposed change to the Project Manager. This evaluation and recommendation will be submitted to the appropriate staff who will jointly review the proposal to determine merit. If the proposal is determined to have merit, processing of a Change Order will proceed in accordance with those procedures. If the proposal is determined not to have merit, a denial letter will be drafted by the Project Manager providing the reasons for denial will be forwarded to the Contractor with a copy stored in the project files.

**For Federal/State Projects,** full settlement shall be made in accordance with T.C.A. 54-05-122. Metro shall be required to provide the necessary notice in a newspaper of general circulation as stated in T.C.A. 54-05-122. The contractor shall also provide an affidavit (Form 8-34) as evidence that materials, labor, and payment comply with this statute.

Any claims against Metro should be made in accordance with Sections 105.16 and 107.19 of TDOT Standard Specifications and 23 CFR 635.124.

Metro will issue a Completion Notice to advertise the construction contract for claims. Metro shall have a request for the filing of claims published in an area press service (with the greatest coverage) for two consecutive weeks (one advertisement per week). The notices shall include a due date for claims that meets current T.C.A. guidance, currently at least 30 days from the last published date. The Project Manager will mail copies of the request to the Prime Contractor, Surety Agent, and the LPDO.

# 15. PAYMENTS

## 15.1. Contractor Payments

The CEI shall reconcile invoices submitted from contractors checking all quantities and materials by reviewing and certifying all field data such as tickets for construction materials, actual quantities versus estimated quantities, daily reports, field notes, and any other form of inspection documentation including but not limited to daily reports, ticket collection and validation, reconciliation of work hours, materials, quantities, and actual versus estimated costs. CEI will verify invoice and project documentation for accuracy and recommendation for payment.

All field measurements will be recorded for review by Metro or auditors. Test reports will be on file prior to payment. The Metro Project Manager must approve any waiver of testing documents prior to payment. Copies of approved subcontracts as well as copies of actual DBE subcontractor's contracts should be on file prior to the first Progress Payment.

### 15.1.1. Certified Payrolls and Compliance Interviews

For state/federal projects, the Contractor and Sub-contractors shall submit to the CEI a weekly payroll of wages paid to each employee with a certification statement as required in TDOT Special Provision 1273, Section V, (23 CFR 635.118). TDOT Circular Letter 1273-02 provides additional information.

The CEI shall conduct at least one (1) contractor employee interview monthly to verify that the payroll submitted is accurate and employees are being paid properly (hours and wages). TDOT Circular Letter 1273-03 provides additional guidance on the required employee interviews.

### 15.1.2. Measurement and Payment Criteria

Measurement and payment criteria for individual line items shall be in accordance with the latest TDOT Standard Specification, unless indicated otherwise in the contract or Metro Specifications.

### 15.1.3. Required Documents for Payment Submittal

The CEI shall ensure that each pay application from the Contractor is complete with all required backup documentation prior to certification and submittal by the CEI. Contractors shall submit the following invoicing forms (or similar equivalent) and backup documentation when submitting a pay request:

- Application and Certificate for Payment
- Continuation Form (if necessary)
- Stored Materials Calculation Sheet
- Material receipts showing the date quantity and purchased, and when item was delivered.
- Approved Change Orders
- Any additional information/documentation needed to justify items, quantities, contract increases and decreases on the pay application. This may include but is not limited to field authorizations, material certifications, material tickets, permit receipts, etc.

#### 15.1.4. Processing Payments

Pay quantities will be submitted by the contractor for review and payment on a standard form provided for that purpose by the Metro Project Manager. CEI will coordinate with the Contractor so that his payment request document matches the approved monthly pay quantities each month. Once the payment request is in order, CEI will sign pay estimate and submit to the Metro Project Manager with recommendation for payments. Payments for stockpiled material may be made as defined in the Standard Specifications and approved by the Project Supervisor. The CEI will observe, measure, and record all quantities for payment. The records will be recorded on a standard form (field book) approved by the Metro Project Manager and/or on field inspection forms to be submitted to the Metro Project Manager. Earthwork will be measured in its original position by cross sectioning the area excavated, in accordance with TDOT Standard Specifications.

### 15.2. Departmental Payments for Work in the ROW

The responsibilities of Metro Water Services Stormwater Division (MSW) and NDOT outlined in this section is based on the Memorandum of Understanding (MOU) entered by the two departments on May 10, 2002 (NDOT was known as Public Works at that time). As a result, MSW and MWS have developed guidelines for payment responsibilities for the following work activities in the ROW: roadway surface/pavement, sidewalks, tree wells in sidewalks, alleys, cross-drains, inlets/castings, inlet boxes, storm sewer pipe systems, box culverts/bridges, driveway pipes/headwalls, roadside ditches, springs inside and outside the roadway, debris in the roadway, and TDOT roadways.

#### 15.2.1. Who Pays for what work?

NDOT is responsible for maintaining the roadway as a safe and functioning path of travel for the motoring public. NDOT is responsible for the pavement, curb and gutter, driveway ramps, potholes, and properly sized cross-drains and stormwater pipes. If a pipe collapses in the roadway, NDOT takes the lead to repair it since the roadway is not functioning until the repair is made. If the failed pipe is of proper size, NDOT is responsible for the repair. If

the repair is an emergency, NDOT will take the appropriate action to barricade the damaged area and either makes the repairs with their crews, through an existing open contract, or through the bid process.

The supervisors at MSW and NDOT work together on a weekly basis to ensure the safety of the public. If either department sees a dangerous condition, they take action to make the area safe until the appropriate repairs are made. Neither Department walks away nor points the finger at the other. We work together to solve problems.

**Roadway Surface / Pavement:** NDOT is responsible for maintain the roadway surface.

**Sidewalks:** NDOT is responsible for sidewalk maintenance and construction. Drainage systems required for the sidewalk are part of the project to be paid for by NDOT. Water on the sidewalks that may freeze in the winter is the responsibility of NDOT. Tripping hazards are also addressed by NDOT.

**Tree Wells in Sidewalks:** MSW has initiated a pilot project and has dedicated funding to replacing metal tree grates in sidewalk areas with a flexi-pave material made from recycled tires. MSW will continue to work with NDOT and Metro Parks regarding ROW trees and tree wells.

**Alleys:** Traditional alleys were constructed with a reverse crown or with the pavement in a "V" cross-section. The surface of the roadway is the driving surface and the conveyance for the stormwater. NDOT is responsible for maintaining the pavement and addressing issues with ponding water. If inlets are needed to correct drainage problems brought to our attention by citizen requests for service, MSW may initiate a Capital Project to be cost shared/ coordinated with NDOT.

**Cross-drains:** Properly sized cross-drains that have failed are the responsibility of NDOT. If a pipe needs to be replaced prior to re-paving the roadway NDOT takes the lead. If a pipe is undersized and needs to be replaced due to failure or paving, MSW takes the lead.

**Inlets / Castings:** MSW is responsible for street sweeping and cleaning the surface of the inlets on a periodic basis. MSW has inlet crews to clean inlets as part of rain routes or in response to customer requests. Much of the inlet cleaning is a result of proactive maintenance generated within MSW. Broken castings are the responsibility of MSW; however, if NDOT arrives on the scene before MSW, NDOT will make the roadway safe by coning off the area or through other temporary measures.

**Inlet Boxes:** MSW takes responsibility for maintaining the structural integrity of inlet boxes.

**Storm Sewer Pipe Systems:** MSW is responsible for cleaning and repairing storm sewer systems in the ROW.

**Box Culverts / Bridges:** NDOT is responsible for the structural integrity of box culverts and bridges. MSW will respond to calls and will remove debris from the creeks that is present at all roadway crossings. NDOT takes the lead on replacing boxes and bridges based on condition as determined by periodic inspections.

**Driveway Pipes / Headwalls:** MSW takes responsibility for cleaning or replacing driveway pipes and headwalls within the ROW. Driveway pipes or bridges outside the ROW on private property are the responsibility of the property owner.

**Roadside Ditches:** MSW is responsible for maintaining roadside ditches. In some cases, the roadside ditch is a stream and the edge of pavement may wash out during intense rainfall events. In those cases, the managers at MSW and NDOT work together on a case-by-case basis to make the repairs to re-establish a safe roadway.

**Springs in Roadway:** Water coming to the surface through the pavement within a roadway is the responsibility of NDOT.

**Springs Outside the Roadway:** If the spring is introducing water onto the roadway into the path of travel, MSW may initiate a project to add a spring box and/or inlet to collect the spring water and pipe it to an existing drainage system.

**Debris in the Roadway:** NDOT is responsible for debris in the roadway. However, if MSW is on the scene before NDOT, MSW will remove the debris and make the roadway safe.

**TDOT Roadways:** Metro avoids all maintenance activity in TDOT ROWs. We transfer the issues to TDOT for repair or appropriate action. TDOT is also responsible for street sweeping.

#### 15.2.2. Approvals for Payment of Metro Water Items - TBD

### 15.3. Development In-Lieu of Payments

Section 17.20.120(D) of the Metro Code of Ordinances provides the background and requirements related to the payment of funds by developers in-lieu of constructing sidewalks required through the development process. Payment of these funds is coordinated through the Metro Development Services Center and is administered by the Metro Codes Department as part of the building permit fee process.

### 15.4. Participation Agreement Payments

A Developer must first be set up in Metro's financial system as a vendor before payment can be made. Metro/NDOT Finance will work with them to get a vendor number. Most vendors are paid on a Net-30 payment schedule. This means they will get paid 30 days from the invoice date on an approved invoice. Developers shall receive payment in accordance with the terms of their participation agreement. THIS IN NO WAY MEANS THAT WE WILL APPROVE PAYMENT REQUESTS WITHOUT THOUROUGH REVIEW! If disagreements arise between the Developer and Project Manager on the terms of payment, consult the immediate Supervisor, Chief Engineer or Metro Legal for further clarification and assistance.

### 15.4.1. Required Documents for Payment Submittal

Developers shall submit the following invoicing forms (or similar equivalent) and backup documentation when submitting a pay request:

- Cover letter requesting payment for the billing period identified on the invoice.
- Invoice Summary Sheet listing and totaling all invoices paid to date.
- Developer's Invoice identifying the name of the developer (as indicated in the Participation Agreement), date submitted, PA number (resolution number that established the PA), purchase order number, invoice number, project name, billing period, vendor information (name, invoice number and date, service provided, invoice amount), total invoice amount.
- Approved vendor invoices (consultants, contractors, suppliers, printing services, etc.)

Backup documentation includes but is not limited to,

- Stored Materials Calculation Sheet
- Material receipts showing the date quantity and purchased, and when item was delivered.
- Approved Change Orders

Any additional information/documentation needed to justify items, quantities, contract increases and decreases to contracts. This may include but is not limited to timesheets, proof of fees, estimates for additional items/work, field authorizations, material certifications, material tickets, permit receipts, etc.

### 15.4.2. Processing Payments

Upon receipt of an invoice from a Developer (via email, US mail, or hand delivery), the invoice shall be marked with the date received and who received it. The Project Manager shall then scan and review the invoice for completeness and correctness with two weeks of

receipt. If corrections or additional/missing information are needed for invoice approval, the Developer shall be immediately notified via email. The cover letter date and invoice date shall be updated if corrections and additional /missing information will take longer than one (1) week to provide. Approval of an invoice shall only be made after all expenditures have been verified to the Project Manger's satisfaction. If majority of the items on the invoice are satisfactory, a partial payment can be made for the approved items while the developer addresses the issues with the remaining items.

# 16. PROJECT CLOSEOUT

## 16.1. Metro Project

### 16.1.1. Final Inspection and Acceptance

#### 16.1.1.1. Substantial and Final Completion

A project shall be deemed "substantially complete" when it's at the point of completion where it can be certified in writing by the CEI or Engineer that the entire project is in strict conformance with the contract, plans and specifications, such that it can be safely and effectively used and operated by the public for its intended purpose without further delays, disruptions, or other impediments. For conventional bridge and roadway work that means the point at which all bridge deck, parapet, pavement structure, shoulder, drainage, sidewalk, permanent signing, permanent pavement markings, traffic barriers, safety appurtenance, utility, and lighting work is complete.

Partial completion may be required for a specific section or sections of the project and accepted before completion of the entire project. Such section(s) shall be a reasonable length, as determined by the CEI or Engineer, and completed in full accordance with the contract. When sections are completed, the Engineer, after final inspection, will accept the section(s) and relieve the Contractor of any further work or maintenance costs for the accepted section(s). Partial acceptance of a section or sections of a project shall in no way waive or alter any of the terms of the contract. Partial use or occupancy of the project shall not result in the project being deemed substantially complete or be evidence of substantial completion.

After any offsite waste and borrow area(s) are no longer needed, ensure that the disturbed area is stabilized according to TN NPDES Construction General Permit and Metro's MS4 Permit criteria. After the area has reached final stabilization, request a meeting with the Engineer to perform a final inspection. Once the Engineer deems the area acceptable, terminate Contractor obtained permits.

Final Completion shall mean that point at which, as certified in writing by the CEI or Engineer, that the Project is 100% complete and in conformance with the Contract.

If the Contractor fails to complete the work by the close of business on the specified project completion date in the contract (including approved adjustments), the charge of contract time and the associated liquidated damages will include each calendar day between the specified project completion date and the actual date of substantial completion.

Liquidated damages will be assessed in accordance with TDOT Standard Specification 108.9, or another amount specified in the contract. In addition, when applicable, the Contractor shall be liable for all damages Metro incurs because of their failure to achieve Substantial Completion and Final Completion within the times allowed under this Contract.

#### 16.1.1.2. Final Inspection

When the Contractor believes that the construction is substantially complete, then the CEI will conduct a project walk-through with the contractor and Metro Project Manager to generate a punch list of items to be taken care of prior to closing out the construction phase. The CEI or Project Manager will then issue the Notice of Completion which will begin the one (1) year warranty period. The contractor shall complete the punchlist items within 30 calendar days of the final inspection, unless stated otherwise in the contract.

If exclusive offsite waste and/or borrow area(s) were used as part of the Project, the Engineer will not start the process for final acceptance of the Project until the Contractor provides proof of permit termination for all waste and/or borrow area(s). If the Contractor wishes to continue use of the waste and/or borrow area(s), provide the Engineer with a letter indicating the intended use and updated documentation.

#### 16.1.1.3. Final Acceptance

After all punchlist items are complete, the CEI shall confirm, via post project photos, that the construction activity is complete and ready for acceptance and final payments. The photo documentation and an acceptance recommendation shall be submitted to the Metro Project Manager. The Project Manager will then issue the Contractor a Final Acceptance Letter to be effective on the date of the final inspection or the date on which all work was verified by the CEI as being finally complete. The CEI will complete the final record documents for the project and provide to them Metro Project Manager.

### 16.1.2. As-built Drawings

All drawings must be received by the Project Manager before final payment can be made to the Contractor.

#### 16.1.2.1. For Project

All projects are required to have as-built drawings of all approved field changes to the plans. This is separate from to the as-built drawings required for the Stormwater Grading Permit. The CEI, Project Engineer or Contractor shall be responsible for producing the project as-built drawings. They shall be stamped "As-built" on the title

sheet along with the date it was created and who it was created by. All marked changes to the original plans shall be shown in red. The following items are to be covered:

1. **Plans**
   a. **Alignment.** All revised alignment should be shown. Where bearings, curve data, etc., do not change, the data should be checked for accuracy.
   b. **Changes.** Changes in construction limits, if any, should be shown.
   c. **Bridges.** Stations of all bridge ends should be shown.
   d. **Ties.** Ties to any additional found corners should be shown.
   e. **Approach Roads.** The constructed location of all road approaches are to be shown.
   f. **Right-of-Way.** All right-of-way adjacent to private property is to be shown with care for correctness.
   g. **Monuments.** All monuments should be shown.
   h. **Utilities.** All utilities should be shown (e.g., gas, water, commercial power, sewers, etc.), including new, existing, abandoned, and removed facilities.
   i. **Underdrains.** Location, size, and depth of underdrains should be shown.
   j. **Channel Changes.** As-constructed channel changes should be shown.
   k. **Crossings.** Elevations for all aerial and underground crossings of utilities should be shown. (One should not attempt to measure directly from the road to the sag in overhead crossings.)

2. **Profile**
   a. **Grades.** Corrected grades and grade points of intersection (P.I.s) should be shown.
   b. **Equations.** All equations and stationing should be shown.
   c. **Culverts.** Correct culvert lengths, type, invert elevations, and stations are to be shown.
   d. Skew angles and as-built grades should be shown.
   e. **Extensions.** On culvert extensions, the length of existing pipe, as well as extension, should be shown.

3. **Permanent Bench Marks**
   a. Monuments. Data on monuments should be shown.
   b. Datum. Datum used for levels should be shown.

4. **Retaining Walls**
   Limits and type of wall are to be shown on profile sheets.

5. **Guardrail**
   Corrected stationing, lengths, and offsets from edge of pavement or travel lane, if different than original plans, should be shown.

6. **Fencing**

Construction limits of fencing in relation to centerline should be shown.

7. **Typical Sections**
   Any revisions in both dimensions and materials should be shown. Also, stations, if termini were revised, should be shown.

8. **Bridges**
   Any changes in bridge plans should be shown. If built without changes, it should be indicated on the plans that no changes were made. Information required for bridges includes the following:
   a. **Subsurface Log.** A log of foundation material encountered if substantially different than information shown on plans. Log sheets should be attached to plans if necessary or convenient.
   b. **Pile Driving Records.** Pile driving records including size, length, type, bearing, and tip elevation should be included. Record sheets should be attached to plans if necessary or convenient.
   c. **Elevations.** Footing and seal elevations, if different than plan, should be included.
   d. **Changes.** Any changes in plan or dimensions should be noted, including any major changes in reinforcing. (for example, development length, reinforcement size, main reinforcement spacing).
   e. **Post-Tensioning.** After completion of the structure post-tensioning, the as-constructed plans should record the stressing sequence, jacking force, duct size and layout, additional rebar or changes in concrete dimensions to accommodate the contractor's proposed post-tensioning system, and whether one end or two end stressing, etc. The revised working drawings should be attached to the as-constructed plans if necessary. The working drawings are the approved drawings submitted by the contractor.
   f. **Construction Sequence.** Changes to the construction or concrete placement sequence should be recorded on the as-constructed plans if different from the as advertised contract plans (for example, sequence for placing concrete deck).
   g. **Bearings.** Bearing orientation angle should be recorded on the as-constructed plans if different from the as-advertised contract plans. Measure the orientation angle using the centerline of bearings and the centerline of girders.
   h. **Expansion Joints.** The actual clearance at each expansion joint and the clear distance between the end of the superstructure and the abutment backwall should be recorded on the as-constructed plans along with the atmospheric temperature at the time of measurement.

At the completion of the project, the hard copy of the as-built drawings or the electronic copy in PDF format, should be sent to the Project Manager.

#### 16.1.2.2. For Stormwater Grading Permit

The as-built drawings for the Grading Permit shall be done in conformance with the permit requirements and a copy shall be submitted to Metro Stormwater.

### 16.1.3. Final Change Order

Prior to final payment, the CEI shall prepare, certify and submit to the Project Manager, a final change order by that reflects all changes to the contract price, whether resulting from field or change authorizations not already reflected in a change order. The Project Manager will review, approve, and process the final change order within two weeks of receipt.

### 16.1.4. Final Payment

If the CEI confirms that the project is in full accordance with the plans, specifications, and contract obligations, the CEI shall submit a final approval for payment to the Project Manager certifying that the project is complete and the Contractor is entitled to the remainder of the unpaid contract price, less any amount withheld for liquidated damages or other deductions as allowed by the contract.

The Contractor will be required, by the contract, to be entitled to receive final payment. Although the contract allows up to 60 days for Metro to make final payment to the Contractor, the CEI and Contractor should coordinate the submission of the final payment application and the required documents in this section to minimize delays in payment by Metro. Once all the required documents have been received by the Contractor, the Project Manager shall approve and process the final payment.

In accordance with the contract, the Contractor shall submit the following information to the Project Manager in the form and manner required by Metro:

1. An affidavit that all of the Contractor's obligations to subcontractors, laborers, equipment and material suppliers and other third parties in connection with the Project have been paid or otherwise satisfied;

2. Separate releases of claims or claim waivers from each subcontractor, lower tier subcontractor, laborer, supplier or other person or entity who has or might have a claim against the Metro or the payment bond;

3. Consent(s) of surety to final payment; and,

4. All product warranties, operating manuals, instruction manuals and other record documents, drawings and things customarily required of the Contractor as part of or prior to Project close-out.

### 16.1.5. Release of Claims

See Appendix 16.A for an example of the Contractor's Release of Claims.

### 16.1.6. Warranty Period

During the warranty period, the Contractor shall be specifically obligated to correct, repair or replace any and all defective or nonconforming work without additional compensation for a period of twelve (12) months following final completion upon written notice from the Project Manager. Additional warranty period may be required as part of a Landscape Maintenance Agreement if part of the project.

#### 16.1.6.1. Warranty Inspection

At least 45 days prior to the end of the Contractor's warranty period, the CEI or Project Manager shall conduct a project walk-through with the construction contractor to generate a punch list of the warranty items and additional work to be taken care of prior to final acceptance of warranty period work. Upon completion of the punch list, the CEI shall submit the punch list to the Metro Project Manager. The CEI will take photos of the completed warranty items and additional work and submit them in a report to the Metro Project Manager for preparation of the Final Acceptance Notification/Completion of Warranty Period letter. This report should note any additional warranties that will go into effect for the replaced, repaired or installed items.

#### 16.1.6.2. Warranty Acceptance

Upon verification of completion of the warranty period punchlist items, the Project Manager shall issue the Contractor a Final Acceptance Letter for the Warranty Work. The Project Manager can now, close the Contractor's purchase order and contract in Metro's Financial System, and archive the remaining documents according to the record retention process in Chapter 17.

### 16.1.7. Final Construction Report

Upon receipt of all record documents from the CEI, the Metro Project Manager will complete a final construction report and file it along with all the project files according to the record retention procedures in Chapter 17. See Appendix 16.B for an example and instructions for final construction report.

## 16.2. Metro Bridge Project

In addition to the project closeout procedures in Chapter 16.1, a copy of the bridge as-built drawing must be provided to the NDOT Bridge Program Coordinator to schedule an initial bridge inspection with TDOT for inclusion in the National Bridge Inventory and to be add to TDOT's bi-annual inspection cycle.

## 16.3. State/Federal Project

State/Federal projects shall follow the close-out procedures outlined in the TDOT Local Government Guidelines Manual and in Section 16.1.

## 16.4. Participation Agreement Projects

Participation Agreement Projects shall follow the close-out procedures outlined in Section 16.1 unless stated otherwise in the Agreement.

# 17. RECORDS RETENTION

## 17.1. Metro Project Files

All Metro Employees with the responsibility of ensuring project records are retained, shall take Metro's Records Management Training. Project Managers shall ensure all project records (both electronic and hardcopy) are filed according to the established file structure. The electronic project records shall be stored in the appropriate project file folders on the network drive and hardcopy project records shall be stored in Metro record retention boxes in accordance with Metro's Records Management procedures.

The Project Manager shall work with the Department's Records Officer to have the project's record retention boxes sent to the Metro Records Center.

## 17.2. Federal/State Project Files

Once the project is complete and the End of Job Certificate has been submitted to TDOT, the Project Manager shall ensure all project records (both electronic and hardcopy) are filed according to the established file structure. The electronic project records shall be stored in the appropriate project file folders on the network drive and hardcopy project records shall be stored in Metro record retention boxes in accordance with Metro's Records Management procedures. Project may be audited by TDOT, FHWA, or others during the retention period.

The Project Manager shall adhere to the latest records retention guidelines outlined in the TDOT LGGM Chapter 8, Records Retention Section. These guidelines require the following:

> The Project Records shall be organized, indexed, and available for review on an as needed basis. An index shall be placed in the End of Job Folder. Boxes shall be numbered consecutively and labeled by Contract Number or Project Number, and County.
>
> **All documents shall be kept for a minimum of seven (7) years after everything is closed and finalized.** These documents include, but are not limited to:
>
> - copies of the contract
> - starting notice/work order
> - correspondence
> - field books
> - diaries
> - material tickets
> - test reports
> - progress estimates
> - final record books

- as-built drawings and specifications
- contractor payrolls and certifications
- field notes
- inspection reports
- notice to contractors
- estimates
- correspondence for advertising and receiving bids
- letting advertisements
- bid tabulations
- bid books (proposal contracts) completed by the contractor
- project specifications and provisions
- job estimate
- contract
- bond certificates

The Project Manager shall work with the Department's Records Officer to have the project's record retention boxes sent to the Metro Records Center.

# APPENDICES

Appendix 2.A – NDOT Organizational Chart

Appendix 6.A – Solicitation Request Form

Appendix 6.B – EBO Cost Breakdown Spreadsheet & Instructions

Appendix 6.C – Metro CEI Scope of Services for IDIQ Contract

Appendix 6.D – CEI Scope of Services for State & Federal Funded Projects

Appendix 9.A – Metro Permit Inspection Manual

Appendix 9.B – Bicycle Pedestrian Safety Regulations

Appendix 9.C – Low Impact Utility Marking Policy

Appendix 9.D – Off-Duty Police Uniform Policy

Appendix 9.E – MPW Engineering ROW Closure Policy

Appendix 9.F – Utility Cut Repair Guidelines and Specifications for the Permitting Process (Appendix D Long Range Paving Plan)

Appendix 10.A – Utility Coordination Notification

Appendix 13.A – Development Services Pre-Construction Agreement

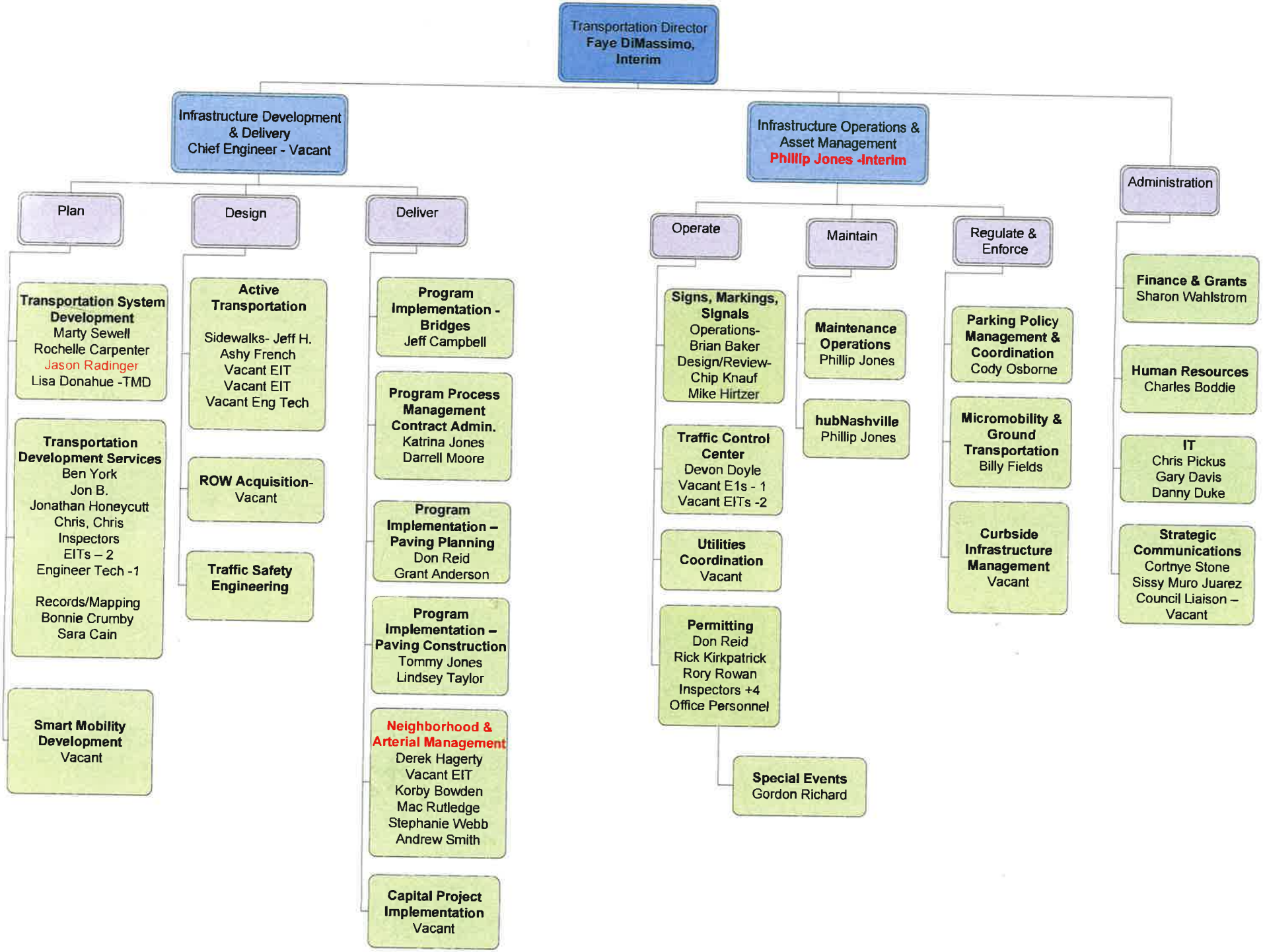
Appendix 13.B – Metro Nashville Curb Ramp and Sidewalk Construction Inspection Standard Procedures

Appendix 14.A – Example Field Authorization and Change Order Form

Appendix 16.A – Example Release of Liens AIA Form G706A

Appendix 16.B – Final Construction Report Instructions and Example

# Appendix 2.A – NDOT Organizational Chart


Transportation Director
Faye DiMassimo,
Interim
Infrastructure Development & Delivery
Chief Engineer - Vacant
Plan
Transportation System Development
Marty Sewell
Rochelle Carpenter
Jason Radinger
Lisa Donahue -TMD
Transportation Development Services
Ben York
Jon B.
Jonathan Honeycutt
Chris, Chris
Inspectors
EITs – 2
Engineer Tech -1
Records/Mapping
Bonnie Crumby
Sara Cain
Smart Mobility Development
Vacant
Design
Active Transportation
Sidewalks- Jeff H.
Ashy French
Vacant EIT
Vacant EIT
Vacant Eng Tech
ROW Acquisition-
Vacant
Traffic Safety Engineering
Deliver
Program Implementation - Bridges
Jeff Campbell
Program Process Management Contract Admin.
Katrina Jones
Darrell Moore
Program Implementation – Paving Planning
Don Reid
Grant Anderson
Program Implementation – Paving Construction
Tommy Jones
Lindsey Taylor
Neighborhood & Arterial Management
Derek Hagerty
Vacant EIT
Korby Bowden
Mac Rutledge
Stephanie Webb
Andrew Smith
Capital Project Implementation
Vacant
Infrastructure Operations & Asset Management
Phillip Jones -Interim
Operate
Signs, Markings, Signals
Operations-
Brian Baker
Design/Review-
Chip Knauf
Mike Hirtzer
Traffic Control Center
Devon Doyle
Vacant E1s - 1
Vacant EITs -2
Utilities Coordination
Vacant
Permitting
Don Reid
Rick Kirkpatrick
Rory Rowan
Inspectors +4
Office Personnel
Special Events
Gordon Richard
Maintain
Maintenance Operations
Phillip Jones
hubNashville
Phillip Jones
Regulate & Enforce
Parking Policy Management & Coordination
Cody Osborne
Micromobility & Ground Transportation
Billy Fields
Curbside Infrastructure Management
Vacant
Administration
Finance & Grants
Sharon Wahlstrom
Human Resources
Charles Boddie
IT
Chris Pickus
Gary Davis
Danny Duke
Strategic Communications
Cortnye Stone
Sissy Muro Juarez
Council Liaison –
Vacant

# Appendix 6.A – Solicitation Request Form

**SOLICITATION REQUEST INFORMATION** *(Procurement Staff will be in Touch to Refine the Data)*

Solicitation Request Title:

Date of Request:

High Level Description of Request (1 sentence or short paragraph):

Example:
Request for office supplies contract. Supplies are to be ordered online and delivered to the departments. Departments placing orders are to be individually invoiced.

Is this replacing an existing contract? No If so, what is the Contract Number?

Contract Expiration Date:

Select from one of the following:

Select from one of the following:

Select from one of the following:

- Invitations to Bid (ITB) are awarded the lowest cost bidder, meeting specifications and scheduled delivery requirements. Awards are modified only by small business and/or service disabled veteran owned business inclusion as required by Code. ITBs cannot be negotiated, the bid is what the bid is and as a result this is the fastest solicitation process.
- Requests for Proposals (RFP) are awarded to the offeror with the highest total score for a predetermined and weighted evaluation criteria list. Cost is one of several evaluation criteria. Criteria beyond cost and SMWBE business participation are evaluated by an evaluation committee. The final offer can be negotiated and as a result, RFPs take longer than ITBs.

**PO/Contract Timelines** (Timeline below begins with the receipt of request in iProcurement and assignment within the Procurement Division – Highly dependent on full and accurate information being submitted by department).

- ITBs resulting in a PO are generally actionable within 45 days.
- ITBs resulting in a Contract are generally actionable within 90 days.
- RFPs for contracted services are generally actionable within 120 days.
- RFPs for A&E services are generally actionable within 150 days.
- RFPs for IT related contracts may exceed 150 days.

**REQUESTING DEPARTMENT'S INFORMATION**

Requesting Department:

Departmental Contact's Name (Project Manager):

Email: Phone:

Estimated Contract/Budget Amount (include cost breakdown for EBO):

Project Contract Life:

Is this Grant Funded? No Grant Commitment Date:

**Note: Please attach a copy of the grant to the requisition**

**ALLOWANCES AND/OR CONTINGENCIES** (Construction Projects Only)

***Allowance Definition:*** **A specific amount determined by the department for specific item of work (i.e. permits, unsuitable soil) to performed as part of the construction phase.**

***Contingency Definition: A specific amount determined by the department for unknown or unforeseen items that may take place within the construction phase.***

Does this project include allowances? **Select One:** If yes, provide the allowance details:

Does this project include contingencies? **Select One:** If yes, provide the contingency details:

## EQUAL BUSINESS OPPORTUNITY (EBO) PROGRAM

The Equal Business Opportunity Program (EBO) went live on July 5, 2019. The EBO Program establishes subcontracting participation goals for Minority Business Enterprises (MBE) and Women Business Enterprises (WBE). The EBO Program Scope and Applicability includes the following categories:

1. Construction: Includes any and all horizontal and vertical construction, including new construction rehabilitations, remodeling and repairs.
2. Non-professional Services: Encompasses the procurement of advertising, printing, non-construction repairs and maintenance, janitorial services, training seminars and workshops, computer and information systems, security, shipping and mailing, microfiche and microfilm, courier, storage, travel, consulting and other non-professional services.
3. Professional Services: Professional Services: Includes the purchase of any or all services covered by Section 4.08.080 for which applicable selection criteria may require a Participant to possess a license or other certificate of competency such as accounting, auditing, architectural, and engineering.
4. Goods: Any and all products, supplies, equipment or commodities.
    a. This only applies to Aspirational Goals. There is no contract/project Goals.

In an effort to have accuracy in our goal setting please provide a cost breakdown of the work elements in the EBO Cost Breakdown Spreadsheet which your department used in determining the budget for this solicitation. The EBO Cost Breakdown Spreadsheet can be found at **http://im.nashville.org/finance/procurement/r12.asp**. After a review of this information by the BAO Director and Procurement Data Officer; the goal will be sent to the Goal Setting Committee consisting of the Purchasing Agent, BAO Director, and Department Head.

## SPECIFICATIONS (Specifications are required for an ITB – optional for RFP)

If this request is for specific product(s), please provide the specifications below:

**Definition:**

- The description or identification of some product in a precise manner. It is preferable to express it in a measurable way since substitutions must be considered when a product line or model is provided. State clearly the objective of the product if measurable specifications are not available.

**Examples for Ergonomic Chair & for Paint:**

- Super Patriot 5600 with sliding seat adjustment. JR-70 Armrest
- BC 44 Multifunction with BJR-2 T armrest and sliding seat
- Or Metro Approved Equal for Substitution

- Room is to be painted in Sherwin Williams #347, eggshell finish – supplier walk through required prior to bid. See bid for dates and times.

Or see the attached Specifications file named (optional):

**MINIMUM REQUIREMENTS** (optional – standard on IT related solicitations)

Provide any minimum requirements for this request (optional):

**Definition:**

- This is not always necessary but it is the lowest level of acceptance that can be considered. Any offer not satisfying the minimum requirement will not be considered. So be careful painting yourself into a corner!
- *Caution: Unless functionally necessary, maximum competition is required by law.*

Example:

1. No less than 15 pounds.
2. No longer than 30 feet.
3. Must be compatible with ESRI.

Or see the attached Minimum Requirements file named (optional):

**SCOPE OF WORK** (SOW is **required** for RFP – optional for ITB)

Provide a scope of work for this request:

**Definition:**

- The work to be performed under this procurement in the completion of a project or service. Identify if it will be restricted to what is being solicited or if the solicitation is only representative of the work to be performed under this contract. The SOW is typically broken out into1) specific tasks, 2) deadlines and 3) approvals.

**Example of an IT SOW:**

Selected firm will provide end-to-end mobile application development services in a collaborative environment to meet the business objectives of Metro. The application should be interactive, easy to use and meet Metro's IT security requirements. This is a project specific engagement. Offeror will gather the requirements, analyze, design, develop, implement, test and integrate the application according to the guidelines and schedules stated in the RFP. Provide a detailed list of deliverables, processes involved, end products, review and approval process etc.

Offeror will deliver the project to Metro by June 1, 2019, providing weekly status reports and project updates. Define the task/ project start and finish dates, timelines for different phases of the project and the various milestones.

Metro will review and validate planned implementation processes, approve process after testing, and sign-off on all milestones prior to acceptance of deliverables.

Or see the attached Scope of Work file named (optional):

## **FUNCTIONAL REQUIREMENTS** (optional)

Provide any functional requirements for this request (optional):

**Definition:**

- A functional requirement defines a function of a product/system and its components. A function is described as a set of inputs, the behavior, and outputs (results).

**Example:**

- Display the name, total size, available space and format of a flash drive connected to the USB port. Other examples are: add customer and print invoice.

**Typical Functional Requirements Include:**

- Business Rules
- Transaction corrections, adjustments and cancellations
- Administrative functions
- Authentication
- Authorization levels
- Audit Tracking
- External Interfaces
- Reporting Requirements

Or see the attached Functional Requirements file named (optional):

## **QUALIFICATIONS REQUIREMENTS** (optional)

Provide any qualifications requirements for this request (optional):

**Definition:**

- A specific skill, type of experience, knowledge, license or certification that makes a supplier qualified to perform the work being sought through this business engagement.

**Example:**

1. Offeror must be an active CPA with 3 years of experience servicing municipalities no less than a 550,000 population.
2. Offeror must have been an active participant in the implementation of the software being proposed.

Or see the attached Qualifications Requirements file named (optional):

Are background checks required for those performing the services onsite (optional)? **Select One:**

If so, what staff must have background checks (optional)?

Type of Background check required (optional):

## **DELIVERY INFORMATION** (optional)

Provide any delivery requirements for this request (optional):

**Example:**

- Must be delivered / serviced between 8:00 AM and 3:30 PM on regular workdays, or.
- May only be performed after 5:00 PM or on weekends but all work must be completed by 4:00 AM and area cleaned.
- All contract deliverables must be provided and approved by May 5th.
- Inside delivery – No dock provided – Performed by supplier or shipper, supplier prepaid freight.

Or see the attached delivery information file named (optional):

## SENSITIVE INFORMATION

**Definition:**

- Sensitive Information is defined as any information classified as "Confidential" or "Restrictive" as defined by the Metropolitan Government Information Classification Policy (see http://www.nashville.gov/Information-Technology-Services/Information-Security/Information-Security-Policies.aspx). The classification of the data that a Contractor is given access to should be determined by and communicated to the Contractor by the requesting department.

Please indicate if a Contractor will be providing a service or solution that will be used to collect, store, process and/or have any access to any information classified as "Sensitive" by the department. Examples of Sensitive information can be found below. Please check any applicable boxes to the scope of work/services.

☐ Social Security Numbers

☐ Protected health information, including medical records of patients

☐ Credit card numbers and any related personal identification numbers or authorization codes

☐ Records of students in public educational institutions

☐ Investigative reports

☐ Criminal Justice and/ or Criminal History Record Information

☐ Attorney/client privilege

☐ Bank account information, including routing and account numbers

☐ Standard Operating Procedures including, but not limited to:

☐ All riot, escape and emergency transport plans

☐ All contingency plans of a governmental entity prepared to respond to or prevent any violent incident, bomb threat, ongoing act of violence at a school or business, ongoing act of violence at a place of public gathering, threat involving a weapon of mass destruction, or terrorist incident.

☐ Information that could be used to disrupt, interfere with, or gain unauthorized access to electronic information or government property.

☐ Residential street address, home telephone and personal cell phone numbers of public employees

☐ Proposals received in response to a request for service prior to the completion of evaluation for service

☐ Information that would allow a person to obtain unauthorized access to confidential information or to government property

☐ Plans, security codes, passwords, combinations, or computer programs used to protect electronic information and government property

☐ Information that would identify those areas of structural or operational vulnerability that would permit unlawful disruption to, or interference with, the services provided by a governmental entity

☐ Information and records that are directly related to the security of any government building, including, but not limited to,

☐ Information and records about alarm and security systems used at the government building
Security plans, including security-related contingency planning and emergency response plans

☐ Blueprints and information about building infrastructure (water, electrical, network, etc.)

☐ OTHER _____

☐ Will Contractor provide, license, or sell software or computer related hardware that will reside on systems, workstations, or devices on the Metro Government network or as a component of the Metro Government IT Infrastructure?

☐ None of the above apply.

## ITS RELATED OR INVOLVED SCOPES ONLY:

Has ITS reviewed this scope or have you been in contact with ITS about this requests? **Select One:**

If Yes, provide the name of the individual from ITS:

## MULTIPLE DEPARTMENT USE OF CONTRACT

Unless the contract states otherwise, all contracts are Metro-wide. What other departments do you think might use this contract (optional)?

, ,

, ,

## CRITICAL SUPPLIERS TO SEND SOLICITATION

Solicitations are sent to all registered suppliers for this product/service. Are there critical suppliers to whom this solicitation should be directed?

, ,

, ,

## RFP EVALUATION CRITERIA (information will not be used for ITB)

If the evaluation criteria are known, attach as a separate document to the requisition. Below are examples of information you might want to see in a proposal. Check any that you believe are important and then provide detail for what should be considered under that heading. Procurement Staff will discuss directing with the identified Project Manager while drafting the solicitation.

- ☐ **Quality Issues**
- ☐ **Supplier Qualification Requirements**
- ☐ **Supplier Experience Requirements**
- ☐ **Scheduling Expectations**
- ☐ **Potential Risks**
- ☐ **Other Important Issues**

Or see the attached evaluation criteria file named (optional):

Procurement Staff assigned to this solicitation will be in touch to refine the solicitation data.

## RECOMMENDED EVALUTION COMMITTEE OR REVIEW BOARD MEMBERS

Provide the recommended members that serve on the evaluation committee or review board.

| Full Name | Representing Dept | Scorer/Resource? |
|---|---|---|

Or see the attached Recommended Evaluation Committee file named (optional):

# Appendix 6.B – EBO Cost Breakdown Spreadsheet & Instructions

EXHIBIT 6.2 - EBO Cost Breakdown Spreadsheet

| TO BE COMPLETED BY THE REQUESTING DEPARTMENT | | | FOR BAO USE ONLY | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Work Item/Commodity Code** | **Estimated Value ($)** | **Notes (Optional)** | Available MBE | Available WBE | Total Available Firms | WBE% Per Work Item | MBE% Per Work Item | MBE $ Amount Per Work item | WBE $ Amount Per Work item | Total MBE% | Total WBE% | | | | | **Available SBE** | **SBE% Per Work Item** | **SBE $ Amount Per Work item** | **Total SBE%** |
| | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | |
| **Totals** | $ - | | | | | 0% | 0% | $ - | $ - | 0% | 0% | | | | | 0% | $ - | 0% | |

## OFFICE OF MINORITY AND WOMEN BUSINESS ASSISTANCE (BAO)

Lindsley Hall
730 2nd Avenue South 1st Floor
Nashville, TN 37219

The Equal Business Opportunity Program (EBO) went live on July 5, 2019. The EBO Program establishes subcontracting participation goals for Minority Business Enterprises (MBE) and Women Business Enterprises (WBE). The EBO Program Scope and Applicability includes the following categories:

1. Construction: Includes any and all horizontal and vertical construction, including new construction rehabilitations, remodeling and repairs.
2. Non-professional Services: Encompasses the procurement of advertising, printing, non-construction repairs and maintenance, janitorial services, training seminars and workshops, computer and information systems, security, shipping and mailing, microfiche and microfilm, courier, storage, travel, consulting and other non-professional services.
3. Professional Services: Professional Services: Includes the purchase of any or all services covered by Section 4.08.080 for which applicable selection criteria may require a Participant to possess a license or other certificate of competency such as accounting, auditing, architectural, and engineering.
4. Goods: Any and all products, supplies, equipment or commodities.
    a. This only applies to Aspirational Goals. There is no contract/project Goals.

In an effort to have accuracy in our goal setting please use the **Solicitation Work Item Request** tab to provide a cost breakdown of the work elements which your department used in determining the budget for this solicitation.

After a review of this information by the BAO Director and Procurement Data Officer; the goal will be sent to the Goal Setting Committee consisting of the Purchasing Agent, BAO Director, and Department Head.

**The EBO Cost Breakdown Sheet has three sections that a Project Manager needs to complete.**

**Column A: Work Item/Commodity Code**

- List work items that include all aspects of your project.
- Separate goods and services if it makes sense for your project.
- You may search for the Commodity Code/UNSPSC via this link: https://www.unspsc.org/.
    - Ensure you select a commodity code that **best describes** your work item, and is as detailed as possible. Avoid utilizing generic codes as much as possible, though sometimes finding a good fit can be difficult depending on the work.

**Column B: Estimated Value ($)**

- Base estimated values off your budget.
- Accuracy here effects the dollars connected to MBE and WBE goals.

**Column C: Notes (Optional)**

- Though they are optional, please include notes for your work items to help the PDO get a better understanding of your project! Especially for more complex or unique projects and work items.

# Appendix 6.C – Metro CEI Scope of Services for IDIQ Contract

# SCOPE OF SERVICES
# FOR
# THE METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY

## CONSTRUCTION ENGINEERING INSPECTION SERVICES
## FOR INFRASTRUCTURE PROJECTS

**Purpose:**

The Metropolitan Government of Nashville and Davidson County (Metro) is seeking qualified Consultant(s) to provide Construction Engineering Inspection services to multiple Metro Departments for various types of infrastructure construction projects within Davidson County having or needing Metro funding. This will be a five year (60 month) contract to be used Metro-wide.

**Objective:**

The Consultant shall serve as the hiring Metro Department's Construction Engineering Inspector (CEI) in the field, performing inspection from the beginning to the completion of projects. They will ensure projects are constructed in accordance with the plans and specifications, and ensure the contractors adhere to the requirements of the environmental and construction permits, and efficiently manage the construction and maintenance of public facilities on Metro owned/leased property or within existing Metro Right-Of-Way (ROW) or within future ROW and/or associated features. The ultimate goal of Metro and the CEI is to administer the contract in a highly professional manner, conducive of a cooperative relationship between the CEI, Contractors, Metro, and to ensure the work is completed on budget and on schedule with a minimum inconvenience and maximum safety to the public.

Inspection services may be needed on a variety of construction projects including disaster and emergency projects. These include, but are not limited to the following:

1. Infrastructure Projects (sidewalks, bikeways, paths, greenways, curb & gutter, structures, bridges, retaining walls, footings, culverts, milling, undercutting, compaction, paving, signage, traffic control, intersection improvements, signals, transportation management systems, etc.)
2. Utility Projects (Water, Sewer, cable, fiber optic, phone, gas, electric, etc.)
3. Erosion Control Inspections
4. ADA Inspections
5. Permit Compliance Inspections
6. Development Inspections
7. Disaster/Emergency Related Inspections

CEI services will also include using GIS, cost estimating, data collection, database management, web pages updates, financial reporting, project scheduling, field inspections and audits, invoices/pay request review and approval for funded projects and other services as needed by the requesting Metro Department for project/program management and oversite purposes.

SCOPE OF SERVICES
FOR
THE METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY

CONSTRUCTION ENGINEERING INSPECTION SERVICES
FOR INFRASTRUCTURE PROJECTS

**General:**

The CEI shall administer the contract in full cooperation with the Metro Project Manager and/or his representative(s) assigned to the project. Metro will have the final word in regard to challenges of CEI authority by the contractor or decisions made by the CEI regarding the work.

Each inspector is required to have a valid driver's license and reliable transportation to project sites. The Firm(s) will be required to provide the following, at a minimum:

1. A field communication device (e.g., cell phone, iPhone) to send and receive voice, text and email messages in the field and record site conditions, including photographic images, and
2. A laptop, computer, printers and software needed to conduct the inspections and create reports needed for the inspection process.

**Standards and Specifications:**

CEI shall ensure that all construction work shall conform to the current federal, state and Metro Standards, Specifications, Standard Drawings and any other applicable requirements. All work and supporting documentation is to meet the requirements of the TDOT Local Government Guidelines for the Management of Federal and State Funded Transportation Projects and any other requirements incorporated by reference in that document, as well as all requirements and regulations associated with Federal Emergency Management Agency (FEMA) reimbursement programs or other applicable State/Federal programs. Documents shall be submitted in formats that conform to Metro standards and can be easily incorporated into Metro's project management system, unless otherwise required by federal or state requirements.

## Project Tasks:

The CEI may be responsible for the following tasks:

1. **CEI Project Administration:** Provide project administration and coordinate with the assigned Metro Project Manager. Prepare for and attend, when requested, any periodic or in-depth inspections that may be conducted on the project related to project work, progress or records. Prepare for, cooperate with, and assist auditors that may be assigned to review project records, payments, reports, etc. Provide ample inspectors and assistance to adequately oversee all work being done on the contract. Monitor CEI hours worked on the project and justify need for overtime. Prior to starting work, submit to the Metro Project Manager a listing of personnel assigned to the project with their contact information and be available at any time in the case of an emergency on the project. The Project Administrator should also obtain from the contractor a list of contractor's personnel that will be responsible for any occurrence that may arise on the project for the life of the project.

2. **Attend Project Meetings:** Project progress meetings will be conducted weekly unless deemed otherwise by the Project Manager. Throughout the project with Metro Project Manager concurrence, the CEI shall organize, schedule, prepare the agenda and all other meeting materials, attend, and conduct meeting every week with Metro personnel, contractor, sub-contractors, utility personnel and other agencies affected by the project. The Metro Project Manager shall be notified in advance of the scheduled progress meetings. Be prepared to discuss recent progress, upcoming events in the schedule, and problems associated with the project. Record significant information revealed and discussed at the meeting, document the resolution of any issues, prepare and distribute typed meeting minutes to the appropriate agencies and attendees. CEI may also be required to prepare for, attend, conduct, provide supporting documentation and distribute meeting minutes for additional project meetings upon the request of the Project Manager. These meetings include, but are not limited to the following:

    - Pre-bid Meetings
    - Stakeholder Meetings and/or any necessary Public Meetings
    - Utility Meetings
    - Site Meetings
    - Coordination Meetings
    - Issue Resolution Meetings

3. **Pre-Construction Meeting:** Before any work is to begin on a project a preconstruction meeting shall be held to discuss the contractor's plan of operation, required contract provisions, environmental commitments if applicable, erosion control, traffic control/work zone safety, utility relocations, inspection, materials acceptance, independent assurance, quality control plans, certified payrolls, DBE/subcontractors, etc. The CEI will prepare for and conduct the meeting. The Metro Project Manager will arrange a time and location for the meeting and will attend to assist as needed. The contractor, ADA office representatives, Metro Project Coordinator, and all utility owners shall be invited to this meeting. Minutes of this meeting, including an attendance roster shall be kept by the CEI, and key decisions shall be fully documented.

    A project walk-through will be scheduled during the preconstruction meeting. The Design Consultant (if necessary), Metro Project Manager, Inspector, contractor, and representatives from affected utility companies will walk the limits of the project to discuss construction

methods, traffic control, utility coordination, coordination with adjacent projects, and potential issues or problem areas.

4. **Project Construction Inspection:** Provide effective and qualified supervision of all inspection services being conducted by the CEI and sub-consultants. Provide inspection of work, the sampling and testing acceptance, and proper and sufficient documentation for acceptance. Provide inspection services for conformance to Plans and Specifications for all roadway, structures, and specialty items that are being incorporated into the project. Observe, measure, and record all quantities for payment. Record field measurements in project records for review by the Department or auditors. Inspect daily erosion control items for conformance to the plans as well as effectiveness in the field. Notify the contractor of deficiencies. The CEI is not charged with the role of safety regulator, but shall notify the contractor immediately when safety issues are identified. Ensure any safety issues identified are corrected by the Prime Contractor. Imminent safety issues shall be corrected by the Prime Contractor before work proceeds in the affected area.

   **For Roadway Related Work:** The inspection staff shall be knowledgeable about the types of work being performed, be familiar with the contract documents, and certified in accordance with TDOT Standard Operation Procedures (SOP 1-3), when conducting sampling and testing of materials for acceptance. All field technicians shall be certified in the applicable TDOT certification course listed below:

   - OSHA 10 Safety Training Construction (All field personnel)
   - TDOT:
     - Asphalt Roadway Paving Inspector
     - Class 1 Concrete Technician
     - Asphalt Plant Tech Certification
     - Soils and Aggregate Technician
   - TDEC:
     - EPSC Level 1 – For inspectors conducting EPSC inspections
     - EPSC Level 2 – For supervisors of EPSC inspections
   - Nuclear Gauge Training
   - Work Zone Traffic Control and Flagger
   - Bridge Coating Inspector Certification
     - NACE
     - SSPC

   Certification from another State Highway Department, nationally recognized institution, or other approved agency may be acceptable in lieu of the TDOT certification. Prior approval is

required. *Copies of all certifications should be filed in the project records for review by auditors or the Department at any time.*

CEI shall have the personnel available with the necessary certification as listed above to comply with TDOT's Guidelines for Locally Managed Projects.

**For Other Construction Projects:** The hiring Department will provide the necessary standards, specifications, sampling and testing, material certifications, and inspection personnel certification requirements needed to perform and ensure the quality and workmanship of the contractor's work.

5. **Conduct Field Surveys and Staking:** Conduct and supervise surveying services to obtain original, final, as well as progress estimate quantities for payment of all earthwork pay items to the contractor. Conduct construction staking, if not provided by the Contractor. Establish horizontal and vertical control on the project to be utilized by the contractor for construction layout. Otherwise, periodically spot check Contractor's construction staking for accuracy. Be prepared to justify quantities in case of discrepancies by contractors or the Department. Upon request, check construction layout when deemed necessary by the Project Manager. Also, spot check as-built plans, submitted by the Contractor, for accuracy, although the Contractor is solely responsible for the accuracy of his as-built plans.

6. **Plans, Working Drawings and Shop Drawings:** If needed, the CEI will provide office design support throughout the construction period. CEI will report to Metro Project Manager when the contractor requests clarifications or interpretations of contract documents. When additional details and dimensions are needed, the contractor shall prepare working drawings and submit them to the CEI for review, comment, and forwarding to Metro Project Manager for distribution to appropriate recipients for further consideration or action.
   Shop drawings for all types of structures shall be submitted by, or on behalf of the contractor, to the CEI, unless noted otherwise in plans or specifications, for handling with the checking agency and for distribution. Proof of appropriate fabricator certification (as required by the specifications for type of structure to be fabricated) shall be submitted along with the shop drawings.

   CEI will submit all shop drawings to the Metro Project Manager with Contractor's comments and recommendations regarding submittals requesting changes in design or specifications, as appropriate. The Metro Project Manager will then submit shop drawings to the appropriate approving party.

7. **Quality Assurance, Testing and Certifications for Acceptance:** Monitor the testing provided by the contractor in the field as defined in the Contract, Plans or Specifications. Document Contractor's Consultant testing and distribute as required. Monitor documentation of testing by the contractor.

   CEI shall conduct all acceptance testing for the project. Field testing with daily reports includes, but is not limit to, all ACI test for concrete including concrete plant, nuclear density testing and/or proof rolling of earthwork/sub-grade, base stone, asphalt, structural backfill, and pipe backfill as defined in the Standard Specifications and TDOT's sampling and testing schedule. CEI will provide aggregate analysis and moisture testing for roadway embankment and base stone materials as defined in the Standard Specifications and TDOTS sampling and testing schedule. CEI will also perform miscellaneous checking of application rates and dimensions and bearings to assure conformance to Plans and Specifications. Certifications of material submitted by the Contractor will be reviewed by the CEI for the conformity to the Plans and Specifications.

   Asphalt Plant Technicians shall also be at the asphalt plant providing control testing during the manufacturing and mixing of the asphalt as deemed necessary. CEI will perform inspection of all the asphalt paving process from the beginning to the end of each project. There shall be an inspection of the milling, undercutting, paving, and striping of the roadway. Density and temperature test will be performed during the paving process. Daily reports will be required for each step of the process for each project. Asphalt extraction testing will be required on random samples at the asphalt plant site or form samples taken on the roadway.

8. **Changes and Extra Work:** The CEI shall prepare Change Orders, Change Authorizations, Field Authorizations, and Field Directives, when warranted during construction, and forward to the Metro Project Manager for approval and execution. The proposed changed or extra work, and cost to complete the work, shall be verified as being necessary, cost effective, and in the public's best interest. Before any major work/major change can take place, all necessary documents must be signed by all required parties. Before any minor work/minor change can take place, the CEI will provide the Metro Project Manager with documentation of the change for review and approval. Major work/major change is considered as any work that alters the contract amount as outlined in the Change Order section of the Contract, alters the termini, character or scope of work, or increases the completion date of the original contract time. All other changes are considered minor.

   Any changes to the original contract proposal or plans must be documented using the appropriate change document(s) and approved by the contractor, his surety, the CEI and the Metro Project Manager. The approved change document(s) becomes part of the Contract. A

plan revision shall be made by the Design Team when an error, omission, correction, or additional detail is needed. These shall be reviewed and submitted with any applicable comments to the Metro Project Manager for review.

The contractor may also submit Value Change Proposals (VCP) for 1) proposed changes to the plans and specification that will result in net savings to Metro, or 2) the proposed use of particular substitute or equal item, material or equipment as indicated in the plans and specifications. The CEI will consider and evaluate contractor's suggestions for construction modifications/substitutions and make recommendations to the Metro Project Manager for approval or otherwise. The CEI will also prepare any Change Orders, Change Authorizations, and/or Field Authorizations needed to approve the VCP and process any Contract Amendments.

9. **Documentation:** CEI shall maintain a project diary on a daily basis to document the daily activities and major events on the project. The daily diary report shall contain the following as a minimum:

    - Date
    - Weather, amount of precipitation, temperature at morning, noon, evening, cloudy, clear, etc.
    - Contractors on site
    - Contractors' personnel (number and classification) on site
    - Location and work performed by each contractor or subcontractor
    - Hours Worked
    - Type and amount of equipment on site (hours used or idle)
    - Visitors to the project site
    - Orders/directives given to the contractor
    - Accidents/incidents on the project and any details such as police report number, fatalities, causes, time, etc. Obtain a copy of the police report for the project records whenever possible
    - Unacceptable work or materials found
    - Delays (type and length)
    - Days charged, with explanation if not charged
    - Any other details or issues that may affect the completion of the project or be cause for future disputes.

In addition to the daily diary, field records, either written or electronic, shall be kept to specifically document each pay item in the contract. The field records shall contain the

individual and cumulative quantities for progress payments including the dates, stations, locations, dimensions, and calculations for each payment.

The CEI will maintain a digital photographic log of active work, significant features, and issues that arise such as deficiencies in MOT (Ministry of Transportation), erosion control, etc. At the end of each week, the CEI will submit to the Metro Project Coordinator a report detailing the work accomplished during the week and the work scheduled for the following week. This report will list all expected lane closures including the dates, times and what lanes are to be closed.

CEI will use the TDOT Local Programs Guidelines format for maintaining project records. Project files shall be neatly organized to adequately document and record all project correspondence, and provide full support for all payments and decisions made including material certifications and test reports, calculations, invoices, etc.

Metro representatives will be conducting routine project reviews to assure that the quality of construction and project record keeping is satisfactory. Unsatisfactory workmanship, inspection, acceptance testing, recordkeeping, etc. shall be corrected immediately and avoided in the future.

10. **Certified Payroll and Labor Compliance:** CEI will receive and check the contractor's weekly payrolls for conformance to Federal or State wage rates, whichever is applicable. Late payrolls (two weeks late) are justification to withhold progress payment. CEI will notify the Metro Project Manager prior to withholding payments and will notify the prime contractor of late payrolls and request immediate submission. CEI will conduct at least one contractor employee interview monthly to verify that the payroll submitted is accurate and employees are being paid properly (hours and wages).

11. **Progress Payments:** CEI shall reconcile invoices submitted from contractors checking all quantities and materials by reviewing and certifying all field data such as tickets for construction materials, actual quantities versus estimated quantities, daily reports, field notes, and any other form of inspection documentation including but not limited to daily reports, ticket collection and validation, reconciliation of work hours, materials, quantities, and actual versus estimated costs. CEI will verify invoice and project documentation for accuracy and recommendation for payment.

    All field measurements will be recorded for review by Metro or auditors. Test reports will be on file prior to payment. The Metro Project Manager must approve any waiver of testing documents prior to payment. Copies of approved subcontracts as well as copies of actual DBE subcontractor’s contracts should be on file prior to the first Progress Payment.

Pay quantities will be submitted by the contractor for review and payment on a standard form provided for that purpose by the Metro Project Manager. CEI will coordinate with the Contractor so that his payment request document matches the approved monthly pay quantities each month. Once the payment request is in order, CEI will sign pay estimate and submit to the Metro Project Manager with recommendation for payments. Payments for stockpiled material may be made as defined in the Standard Specifications and approved by the Project Supervisor. The CEI will observe, measure, and record all quantities for payment. The records will be recorded on a standard form (field book) approved by the Metro Project Manager and/or on field inspection forms to be submitted to the Metro Project Manager. Earthwork will be measured in its original position by cross sectioning the area excavated, in accordance with TDOT Standard Specifications.

12. **Utility Coordination and Relocations:** CEI shall be experienced in utility construction and inspection.
    a. **Pre-Bid Services:** These services the CEI will provide until the construction contract is awarded. The CEI will attend utility coordination meetings during this period. The Metro Project Manager will set times and places for these meetings. The CEI will assist the hiring Department and their Design Team with utility coordination issues associated with construction. The CEI will review utility relocation concerns and attend site visits related to utility coordination, as necessary.
    b. **During Construction:** Attend utility coordination meetings weekly unless deemed otherwise by the Metro Project Manager. The Department will set times and places for these meetings. Discussion should include recent progress, upcoming events in the schedule, and project-related problems or roadblocks. The CEI will prepare and distribute notices of meetings. The CEI shall prepare the agendas, provide all other meeting materials, and prepare and distribute detailed meeting minutes of the meeting including documentation of the resolution of any issues. Verify that utilities are located in accordance with the plans. Coordinate with utilities and contractors to resolve conflicts. Assist the utilities, design firms, and Metro with issues and help streamline the process to keep construction moving along smoothly.
    c. **Relocations:** Coordination and scheduling with utilities is a critical component of construction and must be maintained throughout the construction term. The individual utility companies will be responsible for providing the QA/QC acceptance of their respective relocations and installations. The CEI will verify that relocations are done in proper locations in accordance with the plans and not in conflict with proposed roadway elements or other Metro facilities.

13. **Traffic Control:** Traffic Control shall be checked daily and additionally as required or requested and document weekly (or as often as necessary). Notify the contractor of deficiencies or problems immediately. CEI must be qualified and capable of conducting traffic engineering related construction inspections services to insure all applicable standards including MUTCD, AASHTO and Highway Capacity Manual Guidelines are met.

14. **Erosion Control Permit Inspections:** The CEI's responsibilities with regards to environmental permits will be limited to construction phase services. The responsibility of obtaining Permit Certification will be that of the Metro Department, not the CEI Consultant.

    CEI shall serve as the Department's Erosion Prevention and Sediment Control (EPSC) Professional for the construction site and will be responsible for performing all EPSC inspections in accordance with Metro's National Pollutant Discharge Elimination System (NPDES) MS4 Permit and Stormwater Management Manual. CEI shall conduct routine twice weekly project inspections and document the findings to assure compliance with the environmental permits and the Storm Water Pollution Prevention Plan (SWPPP). During these inspections, the CEI will inspect erosion control items for conformance to the plans as well as effectiveness in the field, and document findings on the appropriate inspection forms, as required by the SWPPP.

    If the Contractor has its own EPSC Professional for the project, CEI shall conduct monthly QA/QC inspections of their Consultant's EPSC inspection and documentation procedures.

15. **Final Inspection and Acceptance/Warranty Inspection and Final Acceptance:** CEI shall confirm that the construction activity is complete and ready for acceptance and final payments that includes but not limited to creating and completing the final punch list, creating final record documents for all projects, final inspections and contract closeouts will be tracked and reported any the project level, and provide an acceptance recommendation to the Metro.

    When the construction contractor believes that the construction phase of the project is complete, then the CEI will conduct a project walk-through to generate a punch list of items to be taken care of prior to closing out the construction phase. The Metro Project Manager shall be invited to this walk-through. Upon completion of the punch list items, the CEI shall submit the punch list to the Metro Project Manager. CEI will take post project photos to show the work that was completed.

    CEI will prepare the warranty letter and send this letter to the Metro Project Manager to sign before issuing it to the contractor. A copy of this letter shall be given to the Metro Project Manager and the Metro Project Coordinator. CEI will prepare a final construction report that provides a convenient summary of the project during the construction phase. This report should include:

    - The schedule for completion of the project -- planned versus actual
    - Construction costs -- planned versus actual, with identification of all change orders and the reasons for these change orders
    - Comments and discussion regarding the project including unusual conditions encountered during the project, such as contractor deficiency, quantity difference, scope change, etc.

**Warranty Inspection and Final Acceptance:** At least 45 days prior to the end of the construction contractor's warranty period, the CEI shall conduct a project walk-through with the construction contractor and the Metro Project Manager to generate a punch list of warranty items and additional work to be taken care of prior to final acceptance of warranty and additional work. Upon completion of the punch list, the CEI shall submit the punch list to the Metro Project Manager. CEI will take photos of the completed warranty items and additional work, and submit them in a report to the Metro Project Manager for preparation of the Final Acceptance Notification/Completion of Warranty Period letter. This report should note any additional warranties that will go into effect for the replaced, repaired or installed items.

**Other Inspections:**

16. **ADA Inspections:** For all sidewalk or curb inspections, CEI shall
    a. Provide inspection services for all sidewalks, curb, and other concrete related projects and keep records for each project in accordance with Department standards. Typical inspection time is 1-2 hours per day.
    b. Maintain ADA compliance data in GIS applicable format or in a format that can be easily upload to GIS. Collected data, reports, facility maps, sidewalk and curb ramp audits (collected from various inspection sources) shall be provided, to the Departments ADA Compliance Officer daily, the Metro ADA office and the U.S. Department of Justice as requested. Curb Ramp and Sidewalk ADA compliance audits shall be provided in accordance with Department standards as required.
    c. Provide weekly status reports to the Metro Project Manager that summarize the work completed that month, work scheduled to be competed the next month, budget and schedule information, and any unusual occurrences. CEI will initiate Ramp Inspection Reports, Sidewalk Inspection Reports, and any other required report in accordance with Metro procedures.

17. **Permit Compliance Inspections:** For all construction permits issued through the Metro Permit Office, CEI shall on a daily basis visit multiple construction sites throughout Davidson County and verify that contractors are performing work in compliance with issued lane closure, road closure, utility cut, and grading permits.

18. **Development Inspections:** These inspections are performed to ensure Developers have constructed roadway infrastructure that will be turned over to Metro for public use, in accordance with the Metro Department of Public Works plans, specifications and standard drawings. Other CEI tasks in this scope may also be required to ensure compliance. The CEI shall inspect all proof-rolls of sub-grade material, installation of base stone, binder course, wearing surface, and thickness of stone for installation of curbs. CEI shall verify grass strips and sidewalk areas are at the proper graded elevations. CEI shall also inspect curbs for chipping and damage prior to final paving, review and approve bond reductions, attend construction project progress

and site meetings, complete final inspections and acceptance of infrastructure for maintenance and public use.

19. **Disaster/Emergency Related Inspections:** The CEI shall be responsible for providing services such as, emergency contract administration, disaster related damage assessment (including structural assessment and mapping), debris monitoring and documentation, recovery monitoring and documentation, construction inspection for emergency work and environmental clearance support, inspection for any event deemed applicable, and any other related services necessary to apply for State and/or Federal funds or reimbursements. In addition, the CEI shall be responsible for properly documenting and administering all duties in compliance with applicable federal and state programs.

# Appendix 6.D – CEI Scope of Services for State & Federal Funded Project

# SCOPE OF SERVICES
# FOR
# CONSTRUCTION ENGINEERING INSPECTION (CEI)
# ON
# STATE AND FEDERALLY FUNDED PROJECTS

## ***Task xx: Construction Engineering and Inspection Services***

**Purpose:**

The Metropolitan Government of Nashville and Davidson County (Metro) is seeking qualified Consultant(s) to provide Construction Engineering Inspection services to multiple Metro Departments for various types of infrastructure construction projects within Davidson County having or needing Metro funding. This will be a five year (60 month) contract to be used Metro-wide.

This document is to define as clearly as possible the duties of the Construction Engineering and Inspector (CEI) with regard to administration and monitoring of the Metropolitan Government of Nashville and Davidson County (Metro) construction contract and activities. The administration of the Metro construction contract will be conducted by the CEI in full cooperation with the Metro Project Manager (Metro PM) or other representative(s) assigned to the project. The Metro Project Manager will have the final word in regard to challenges of CEI authority by the contractor or decisions made by the CEI regarding the work. The ultimate goal of Metro Public Works (MPW) and the CEI should be to administer the contract in a highly professional manner, conductive of a cooperative relationship between the CEI, contractors, and MPW and to complete the work on budget and on time with a minimum inconvenience and maximum safety to the public.

The responsibilities of the CEI on this project may include but is not limited to:

1. **Project Management Meetings/Updates for transition to CEI Management and Inspections:** Attend meetings and coordinate with the Metro department currently overseeing the project in order to transition project management and inspection services and meet with contractor to address CEI management roles and procedures.

2. **Attend Project Meetings:** Meetings will be monthly unless more frequent meetings are warranted. Prepare the agenda, attend, and conduct meeting every week with Metro personnel, contractor, sub-contractors, utility personnel, TDOT personnel, and other agencies affected by the project. Be prepared to discuss recent progress, upcoming events in the schedule, and problems associated with the project. Record significant information revealed and discussed at the meeting and distributes typed minutes to the appropriate agencies and attendees.

3. **CEI Project Administration:** Provide project administration and coordinate with the assigned Metro PM. Prepare for and attend, when requested, any periodic or in-depth inspections that may be conducted on the project related to project work, progress or records. Prepare for, cooperate with, and assist auditors that may be assigned to review project records, payments, reports, etc. Provide ample inspectors and assistance to adequately oversee all work being done on the contract. Monitor CEI hours worked on the project and justify need for overtime. Prior to starting work, submit to Metro PM a listing of personnel assigned to the

project for review and approval. In addition, a list of persons with emergency phone numbers should always be supplied to the METRO PM and be available at any time in the case of an emergency on the project. The Project Administrator should also obtain from the contractor a list of contractor's personnel that will be responsible for any occurrence that may arise on the project for the life of the project.

4. **Provide Construction Inspection:** Provide effective and qualified supervision of all inspection services being conducted by the CEI and sub-consultants. The CEI is not charged with the role of safety regulator, but shall notify the contractor immediately when safety issues are identified. Ensure any safety issues identified are corrected by the Prime Contractor. Imminent safety issues shall be corrected by the Prime Contractor before work proceeds in the affected area. All field technicians must be certified in the applicable TDOT certification workshops listed below:

   OSHA 10 Safety Training Construction (All field personnel)
   TDOT:

   - Asphalt Roadway Paving Inspector
   - Class 1 Concrete Technician
   - Asphalt Plant Tech Certification
   - Soils and Aggregate Technician

   TDEC:

   - EPSC Level 1 – For inspectors conducting EPSC inspections
   - EPSC Level 2 – For supervisors of EPSC inspections

   Nuclear Gauge Training
   Work Zone Traffic Control and Flagger
   Bridge Coating Inspector Certification

   - NACE
   - SSPC

   Certification from another State Highway Department, nationally recognized institution, or other approved agency may be acceptable in lieu of the TDOT certification. Prior approval is required.

5. **Conduct Field Survey:** Conduct and supervise surveying services to obtain original, final as well as progress estimate quantities for payment of all earthwork pay items to the contractor. Establish horizontal and vertical control on the project to be utilized by the contractor for construction layout. Be prepared to justify quantities in case of discrepancies by contractors or the MPW. Upon request, check construction layout when deemed necessary by Metro PM or Metro Inspector.

6. **Change Order, Force Account, and VECP:** Notify Metro PM of the necessity of any change orders. Negotiate prices for additional pay items with the contractor while adhering to the "Average Unit Price" listing when possible. Coordinate acceptance of prices with Metro PM. Prepare field authorization change orders on the supplied standard form and submit to the Metro PM for final review and submittal for processing. The Change Order shall be submitted to the Metro PM for final approval. Any work that cannot be negotiated with the prime contractor may be pursued by force account or other Metro contract as defined in the Standard Specifications and documented as directed by MPW or as required for TDOT reimbursement. Submit Value Engineering Change Proposals to the METRO PM for analysis and approval.

7. **Shop Drawings:** See specification for road and bridge construction.

8. **Quality Assurance, Testing for Acceptance, and Training:** (*The intent is for the CEI to provide all field testing. Copies of all certifications should be filed in the project records and on SharePoint site for review by Metro at any time. Any temporary waivers of certification or licensing will be reviewed by Metro and/or TDOT for the final decision*.) Provide certification training to CEI personnel for all necessary field testing and inspection. Monitor the testing provided by the contractor in the field as defined in the Contract, Plans or Specifications. Document CEI testing on standard forms provided by Metro or TDOT and distribute as required. Monitor documentation of testing by the contractor. Field testing by the CEI includes, but is not limited to, all ACI tests for concrete including concrete plant for acceptance by Metro, nuclear density testing of earthwork, base stone, asphalt, structural backfill, and pipe backfill as defined in the Standard Specifications and TDOT's sampling and testing schedule. (*Note: All tests will be performed by the CEI*.) Also included, as the responsibility of the CEI, is miscellaneous checking of application rates and dimensions and bearings to assure conformance to Plans and Specifications. The CEI will submit the initial information on forms supplied by Metro or TDOT and receive the final disposition of the material after review. Certifications of material submitted by the contractor will be reviewed by the CEI for conformity to the Specifications. The certification documents submitted to Metro will also be reviewed for completeness and conformance to Metro's or TDOT's standard form of submission. A Final Materials and Tests Certification will be submitted to the MPM and to TDOT with the Final Records.

9. **Progress Payments:** The CEI will document and assemble accurate quantities for Monthly Progress Payments to the prime Contractor from actual project field records, as directed by the special provisions in the contract, from change orders or force accounts. The quantities for payment will be referenced to field records prior to submission for payment. Test reports will be on file prior to payment. The MPM and TDOT must approve any waiver of testing documents prior to payment. Pay quantities will be submitted to the MPM for review and payment. Payments for stockpiled material may be made as defined in the Standard

Specifications and approved by the MPM and TDOT. Estimate "cut-off" will be the last day of each month.

Copies of approved subcontracts as well as copies of actual DBE subcontractor's contracts should be on file prior to the first Progress Payment.

Metro's SharePoint site will be used for the CEI's storage of all project records/documentation and estimate payments.

10. **Revisions to the Contract Plans:** Any revisions to the contract plans or cross sections will be submitted to the METRO PM for processing.

11. **Distribution of Correspondence:** Submit to the METRO PM a copy of all correspondence between the CEI, contractor, subcontractor, or others concerning matters related to the project. Maintain an office file copy for submission with the project Final Records.

12. **Inspection of Work:** Provide inspection services for conformance to Plans and Specifications for all roadway, structures, and specialty items that are being incorporated into the project. Observe, measure, and record all quantities for payment. Record field measurements in project records for review by Metro, TDOT, or auditors. The records will be uploaded to Metro's SharePoint site. Check traffic control daily, and additionally as required or requested. Notify the contractor of deficiencies or problems immediately. Document weekly (or as often as necessary) project traffic control on forms supplied by Metro or TDOT and distribute as required. Inspect daily erosion control items for conformance to the plans as well as effectiveness in the field. Notify the contractor of deficiencies.

    Assure that the QA/QC consultant is performing the duties described in the Contract and review documents required quarterly by the QA/QC consultant prior to submitting to the METRO PM for forwarding. Verify the days the QA/QC consultant is on the project. Coordinate the recommendations of the QA/QC consultant with the prime contractor for conformance to Metro Water Services' policies. Prepare to justify any and all pay quantities in the case of questions by the contractor or Department. Prepare an accurate daily diary, signed by the inspector and uploaded into the Metro SharePoint site, consisting of:

    - A record of the contractors on the project
    - Their personnel (number and classification)
    - Equipment (number and type or size)
    - Location and work performed by each contractor or subcontractor
    - Orders given the contractor
    - Events of note on the project

- Accidents on the project and any details surrounding the accident such as police report numbers, fatalities, causes, time, etc. Obtain a copy of the police report for the project records whenever possible.
- Weather, amount of precipitation, temperature at morning, noon, and evening, cloudy, clear, etc.
- Days charged
- Equipment arriving or leaving the project, idle equipment
- Any other details that may be important later in the project life.

13. **Contractor's Payrolls, Employee Interviews and Contract Compliance:** Receive and check the contractor's payrolls for conformance to state wage rates as defined in the contract. Late payrolls (two weeks late) are justification to withhold progress payment. Notify the prime contractor of late payrolls and request immediate submission. Notify the METRO PM prior to withholding payments. Conduct employee interviews on the forms acceptable by TDOT and compare to the submitted payrolls for accuracy. Notify the prime contractor of inaccuracies and resolve discrepancies. Adhere to Special Provisions concerning reports to be submitted to the TDOT Contract Compliance Office.

14. **Reports:** There are numerous reports, documents, etc. that must be generated in the process of contract administration. A copy will be provided by Metro prior to construction, or as needed. Any questions regarding the requirements can be forwarded to the METRO PM for clarification at any time.

15. **Final Records:** Submit a compilation of project records in the TDOT's standard format to the METRO PM after project completion. Make corrections when/if notified and resubmit the records and a final estimate for the project at the appropriate time. Submit all final forms (FHWA-47, CC3, etc.) with the final records. Coordinate CEI hours after the project completion with the METRO PM for approval.

16. **Project Claims:** Prepare documentation and assist in the defense of Metro, when requested, in preparation for Claims or possible Claims resulting in the execution of the contract.

17. **Utility Relocations:** Utility relocations may be a part of this contract. Eligible relocations that are reimbursable will be inspected for quantities that will be reviewed and verified by comparing utility company records prior to payment by Metro.

18. **Utility Coordination:**
    - **Coordinate with affected utilities to ensure timely utility relocation:**
      a. Review utility relocation schedules and drawings.
      b. Monitor utility relocation progress versus the schedule.

c. Meet with utility representatives to discuss the work progress and schedule changes.
d. Communicate frequently with the contractor and Metro to provide updates on the progress and any problems. The vast majority of communications will be written in the form of emails and meeting minutes.

- **Conduct utility meetings as needed on-site or off-site:**
  a. Prepare the agenda, attend, and conduct utility meetings weekly, biweekly, or as requested, and shall record significant information and distribute written minutes to the attendees. Meetings should include Metro personnel, TDOT personnel when necessary, contractor, utility personnel and representatives of other agencies affected by the project.
  b. Discussion should include recent progress, upcoming events in the schedule, and project-related problems or roadblocks.

- **Prepare and distribute any necessary reports:**
  a. Provide frequent utility time and money savings reports. Prepare and distribute meeting minutes which document discussions about proposed changes and their potential effects on time and money savings.

- **Verify that utilities are located in accordance with the plans:**
  a. Compare utility relocation work versus the plans. Confirm the facilities are located in accordance with the plans and do not conflict with other work show on the plans.

- **Coordinate with utilities and contractors to resolve conflicts:**
  a. Meet with the utility, contractor and Metro to discuss any unexpected conflicts. Propose cost effective solutions to resolve conflicts that will minimize the schedule impact and cost to the project.

- **Assist the utilities, design firms, and Metro with issues involving supplemental agreements:**
  a. Help streamline the process to keep construction moving along smoothly.
  b. Follow up with Metro, contractors, and utilities on paper work and drawing submittals where changes are required.

- **Provide professional consulting services:**
  a. The CEI will provide professional consulting services including research and administrative services related to utilities work on roadway construction projects as requested by Metro.

19. **Erosion Control:** This scope requires the provision of a qualified Erosion Prevention and Sediment Control (EPSC) Inspector with the capacity, upon request, to perform supplementary environmental engineering services associated with construction projects. The procedures contained within this scope follow the current National Pollution Discharge Elimination System (NPDES) Construction General Permit (CGP) and the TDOT Statewide Storm Water Management Plan (SSWMP) and MWS Storm Water Management Plan (SWMP) requirements.

    The CEI or independent EPSC Inspector shall be responsible for inspecting and reporting all EPSC activities and features within the project limits and affected areas during each site visit. All EPSC activities and features that occur between site visits shall be documented at the next site visit through inspection and/or information from the STATE project supervisor. The activities outlined below will be performed throughout the life of the specified roadway contract. The CEI or EPSC Inspector shall report directly to the STATE project supervisor. All communications to the contractor will be through the STATE project supervisor, unless otherwise specified by the STATE project supervisor. See - Delegation of Authority. If the STATE project supervisor specifies a designee, please provide the delegation of authority document, to the Contract Coordinator via email and posted in the electronic project file SharePoint site. See - Signature Form.

    - Submit a written summary of qualifications for each inspector associated with the specific project assigned. Each inspector will be stated at the submittal of the estimate for services. No substitutions or additions to the original specified inspectors are allowed without written approval from the Contract Coordinator in the Headquarters Construction Division (HQ CD). The request to substitute and/or add inspectors must be made in writing to the Contract Coordinator, including no more than a one page summary of qualifications. Written approval must be received from the Contract Coordinator before these individuals are allowed to participate in the inspection services. If the inspector holds a Certified Professional in Erosion & Sediment Control (CPESC) certification, that certification must be specified.

    - Copies of the project water quality permits, storm water coverage, the Storm Water Pollution Prevention Plan (SWPPP), and a half-size set of construction plans shall be made available to the CEI. The CEI shall obtain a copy of the contractor's permits and Notice of Coverage (NOC) for any off-site waste and/or borrow area for the STATE project supervisor.

    - Participate in project meetings relative to EPSC, including pre-construction meeting, if possible, on-site meetings with Metro, TDOT and contractor, progress meetings, additional meetings required by the regulatory agencies and others as required. The STATE project supervisor may request participation by the CEI, in biweekly, or

similar, meetings conducted by the STATE project supervisor to discuss progress, problems, (general, as well as specific), erosion control issues and their resolution.

- Make site visits to the construction site to:

  a. Conduct a baseline evaluation, notes and pictures, at each outfall for
     - Documentation of the current conditions prior to road construction activities;
     - Inspection of changes related to siltation, in order to notify the STATE project supervisor of conditions that might negatively impact or have potential for erosion problems (i.e. stability of the bank, sediment deposition, and source impacts) to waters of the State

  b. Review and verify the proper installation, maintenance and effectiveness of EPSC devices/measures per project plans and the SWPPP, or as directed by the STATE project supervisor;
  c. Review the completed installation of EPSC devices;
  d. Review the effectiveness of EPSC devices;
  e. Recommend needed repairs, maintenance and additions to EPSC system;
  f. Provide review of the contractor's repairs, maintenance and additions to the EPSC system. It shall be the responsibility of the STATE project supervisor to provide review of this work if reviews are required prior to the CEI'S routine inspection, except in emergency situations as deemed necessary by the STATE project supervisor. However, this review shall be documented by the CEI at the next routine site visit;
  g. Review areas that have been seeded, mulched or otherwise stabilized for effectiveness and make recommendations for any deficient areas;
  h. Review stabilization efforts which are to be completed as required by the current NPDES CGP and/or TDOT SSWMP after final grading or earth moving activities have ceased;
  i. Review removal of vegetative ground cover occurring as required by the current NPDES CGP and/or TDOT SSWMP and MWS SWMP prior to grading or earth moving unless said area is seeded and/or mulched;
  j. Review requirement of construction phasing for acreage of disturbance soil as required by the current NPDES CGP, the project SWPPP and/or TDOT SSWMP and MWS SWMP. If there is a discrepancy, please contact the STATE project supervisor for clarification.
  k. Perform oversight of contractor's off-site waste and borrow areas for the project, as specified in the TDOT SSWMP and MWS SWMP;

l. Review compliance with the current NPDES Permit, TDOT SSWMP, MWS SWMP and any STATE (MS4) Municipal Separate Storm Water System NPDES permit requirements.
m. The frequency of the site visits shall be as follows:
   - Baseline evaluation prior to start of construction activities at outfalls;
   - As required by the current NPDES CGP and TDOT SSWMP;
   - As required for Quality Assurance (QA) Team compliance visits. The CEI will work in conjunction with or act as a part of the QA Team.

Review and make recommendations on the EPSC plans, possibly prepared by others, so that:

- All EPSC measures are modified to be effective at all times throughout the course of the project;
- The EPSC plan shows all boundaries of right-of-way and/or easements, as well as, the cut and fill slopes, and the watercourse and wetland boundaries contained within the ecology information provided by the Engineer of Record (EOR);
- The timing of implementation regarding EPSC measures coincides with the construction of the road project;
- Initial EPSC measures are in place before clearing, grubbing, excavation, grading, cutting or filling occurs;
- EPSC measures for any relocation of utilities proposed are in place and provide protection for the project before clearing activities occurs if these activities are included as part of the roadway contract;
- Phasing is appropriate for the EPSC measures and devices and EPSC plans and notes address phasing issues required to construct the project;
- Stage construction of the EPSC measures is shown on projects and the most effective staging methods are used;
- All conditions in Section 4 above are met;
- If anything changes on the EPSC plans as shown in the field SWPPP it is documented in the field SWPPP. All revisions to the field SWPPP shall be made by the CEI at each field visit;
- Documentation of all maintenance and repair items necessary on EPSC measures and the corrective action taken for it are shown in the SWPPP. All revisions to the field SWPPP shall be made by the CEI at each field visit.

- Provide comments, suggestions, and correspondence to the STATE project supervisor at each site visit. See – Circular Letter 209.01-02. The CEI shall follow-up site visit communications with the STATE project supervisor with a standard written summary within 48 hours of the site visit inspection, including a photo journal of areas. The CEI shall request from the STATE project supervisor a listing all other parties the CEI shall forward all appropriate information. In some cases, the

STATE project supervisor will request that the CEI clarify any comments directly to the contractor. If this is the case, the CEI shall provide this service in the presence of the STATE project supervisor.

- Maintain records, including documenting photographs (photo journal). See - Circular Letter 209.01-02.
- Provide professional services related to the environmental engineering of roadway construction projects as requested by the STATE.
- Prepare and submit reports to the STATE project supervisor, required by the NPDES CGP, the SWPPP, TDOT SSWMP and MWS SWMP, including:

  a. Reports on deficiencies in the EPSC system and corrective actions undertaken. Information must be specific and recommendations for improvement must be made in the report. The report shall address specifically any items that are reoccurring from past reports;
  b. TDOT Inspection reports See - Circular Letter 209.01-02;
  c. Summary of all site visits, including photos (See - Circular Letter 209.01- 02);
  d. Quarterly reports;
  e. Other documentation required by SWPPP.

  All documentation is to be placed on the Metro SharePoint site for viewing by others. A folder on this site will be set up for each of the CEI'S use. This folder must contain the name of the project including contract number for clarity. The file information and password, if needed, shall be supplied to the STATE project supervisor by email. All documentation shall be placed in a chronological series within these folders. Upon request, these reports shall be provided to the STATE construction office in paper form or via email.

  Verbal reports shall be presented to the STATE project supervisor at each site visit and written reports within 48 hours, so that the contractor can install the necessary recommendations before the next anticipated rainfall event. An email notification shall be sent to the construction office within 48 hours after the inspection for their use.

- Any time the CEI becomes aware that sedimentation is occurring or has occurred in streams impacted by the project, the CEI shall evaluate the EPSC measures employed, make recommendations to the STATE project supervisor to repair or replace defective EPSC measures, and recommendations to install, as applicable, additional or other EPSC measures with the goal of eliminating future sedimentation. If a consensus is not reached between the STATE project supervisor, the contractor and the CEI on appropriate recommendations within 24 hours, the CEI shall notify the Regional Environmental Coordinator for elevation procedure. If authority has

been delegated on this project, the STATE project supervisor shall be notified anytime a sediment release occurs.

- Acquire all appropriate signatures on EPSC inspection forms for these site visits when an inspection is completed. See - Signature Form. Appropriate signatures are required on all forms.

- Metro and/or the Contractor shall install rain gauges at all sites where clearing, grubbing, excavation, grading, cutting or filling is being actively performed, or exposed soil has not yet been permanently stabilized. On specific projects, rain gauges may need to be installed at every mile within the project limits per Metro Stormwater Division. The STATE project supervisor may request the CEI check each gauge after every rainfall event occurring on these sites and maintain detailed records of rainfall events including dates, amounts of rainfall, and the approximate duration or starting and ending times. If the records are maintained by Metro and/or the contractor, the CEI shall be responsible for reviewing these documents at each site visit.

- Prepare and submit any proposals for revision to the EPSC plan to the STATE project supervisor for review and approval by the EOR in time to allow review prior to implementation, except for recommendations for emergency repairs which will be submitted immediately.

- Maintain, within the SWPPP, a running index of revisions, dates, what occurred, and the page numbers of the EPSC sheets. The CEI shall make copies of this index for the STATE project supervisor each time a change is made. All implemented revisions shall be marked by the CEI in red within the field SWPPP, initialed, and dated for revision as soon as the STATE project supervisor, the contractor, and the CEI agree on changes as they are implemented in the field.

- If any revisions will interfere with any of the other water quality permits, the CEI shall contact the Manager of TDOT's Natural Resources Office within the Environment Division and the Manager of Metro's Environmental Compliance Division for guidance before implementing.

- Be available, on call, to the STATE project supervisor in the event of an EPSC emergency.

- Keep a chronological log in sheet anytime a site visit, inspection, and/or attendance at meetings occurs. See – Log Sheet. This log in sheet must include the name of the individuals representing Metro, the date and time of inspection, and be signed by the

STATE project supervisor. This log in sheet must be posted quarterly to Metro's SharePoint site for inclusion in Metro project files.

- Comply with the evaluation process established by Metro Procurement.
- Comply with any revisions to this scope proposed by Metro.
- Comply with the cost proposal process established by Metro.

The responsibilities of Metro on this project are:

1. Provide a Metro Project Manager to oversee and coordinate with CEI.
2. Manage public information/relations for project development.

Delegation of Authority

I (**print name of TDOT project supervisor**), delegate the reporting responsibility of coordination with the EPSC inspection services consultant to (**print name of TDOT delegate**) for contract #

I am providing delegation of authority as stated above and confirm that the TDOT delegate stated above has direct knowledge of the subject project and the ability to discuss the reports and recommendations from the EPSC inspection services consultant on the subject project directly to the contractor.

(**signature of TDOT Project Supervisor**)
(date)

**SIGNATURE FORM**

| | |
|---|---|
| Date of report: | |
| Contract #: | |
| Project Description (including County): | |
| TDOT project supervisor's or delegate's signature: | |
| Representative of Contractor's signature: | |
| EPSC inspection services consultant's signature: | |

I have reviewed the attached dated report for the subject project.

TDOT project supervisor or delegate

I agree with the report as written and will perform necessary recommendations. I agree with the report with the exception of the following comments.

Comments are attached Comments are as follows

TDOT Contractor and all subcontractors

I agree with the report as written and will perform necessary recommendations.

I agree with the report with the exception of the following comments.

Comments are attached Comments are as follows

## Log Sheet

| Date and Time | Type of Visit (Rainfall Event Visit, Weekly Inspection, QA/QC meeting, Construction meeting etc.) | Representative of ESPC Inspection Services Consultant | TDOT Project Supervisor (or designee) |
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| EPSC Chronological Log Sheet – Quarter 1 2 3 4 (Circle One) | | | |
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# Appendix 9.A – Metro Permit Inspection Manual

(This Section is Under Development)

# Appendix 9.B – Bicycle Pedestrian Safety Regulations

METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY

Megan Barry
Mayor

Mark Macy
Public Works
Director

Metro Nashville
PUBLIC WORKS

METRO PUBLIC WORKS
750 SOUTH 5th STREET
NASHVILLE, TENNESSEE 37206

# Bicycle and Pedestrian Work Zone Safety Regulations

(ST-507)
(Pursuant to Ordinance BL-2016-240 –)
07/25/2016

## 1. General:

Each applicant submitting a permit application to the Director which will result in the blockage of a sidewalk, bicycle lane, or other public bicycle or pedestrian path for more than twenty (20) calendar days, shall submit for approval by the Director a traffic management plan that addresses reasonable accommodation for pedestrians and bicyclists before the issuance of a permit by the Director. Projects lasting less than 20 days that are not required to submit a traffic management plan but shall still be required to adhere to the standards for Temporary Traffic Control in latest edition of the Manual on Uniform Traffic Control Devices (MUTCD), the Public Rights-of-Way Accessibility Guidelines of the United States Access Board and all other federal, state, and local legislation and standards. The traffic management plan shall include identification of general milestones for review by the Director at points in the construction process when significant condition changes would alter the traffic management methods.

A permit shall be granted at the discretion of the Director for the blockage of a sidewalk, bicycle lane, or other public bicycle or pedestrian path in a work zone to facilitate activities in the right of way directly related to construction.

## 2. Traffic Management Plan:

The traffic management plan submitted to the Director pursuant to Subsection C.1 of Section 13.20.030 shall require MUTCD-compliant work zone signage, devices and roadway markings that adequately warn right-of-way users of upcoming changes and marks the alternate route as follows:

a. Signage intended only for pedestrians shall display the word “pedestrians” or the pedestrian symbol and shall adequately warn of any route change and clearly mark the alternate route;

b. Signage intended only for bicyclists shall display the word “bicycles,” the word “bicyclists,” or the bicycle symbol and clearly mark the alternate route;

c. Signage shall adequately warn bicyclists, pedestrians, and motorists alike of any lane shift or shared lane condition; and

d. Any additional signage or roadway markings, such as signage or roadway markings for a lane shift, a sharrow lane, or a detour route, shall be provided and maintained for the length of the altered route.

**3. Requirements in Event of Traffic Management Plan Disruption:**
If an accommodation for pedestrians or bicyclists must be closed intermittently due to conflicts with construction activities or other, the traffic management plan submitted to the Director pursuant to Subsection C.1 of Section 13.20.030 shall require that:

a. For project on projects on major and collector streets, flaggers shall be posted at each end of the closed pedestrian or bicycle route during peak traffic hours when the intermittent closure is in place; and

b. The reasonable flow of pedestrian and bicycle traffic be maintained in preference to construction activities and the flow of construction vehicles.

**4. Requirements for Permit Display:**
Before commencing any activities that result in the blockage of a sidewalk, bicycle lane, or other pedestrian or bicycle path, the party requesting a public right-of-way occupancy permit authorizing the blockage must display said permit at a prominent, publicly accessible location near the construction site entrance and must simultaneously display the following information:

a. The range of dates during which the permit is valid;

b. The name and contact information of the party requesting the permit;

c. The reason for the blockage;

d. A phone number and email address that citizens may use to direct questions, comments, and concerns regarding the blockage to the Director.

**5. Right to Revoke Permit:**
The Director may revoke a public right-of-way occupancy permit authorizing the blockage of a sidewalk, bicycle lane, or other pedestrian or bicycle path for any of the following reasons:

a. The permittee fails to comply with any provision of this Section, Section 13.20.035, Reasonable Accommodation for Pedestrians and Bicyclists, MUTCD, the Public Rights-of-Way Accessibility Guidelines of the United States Access Board or any other relevant federal, state, and local legislation and standards.

b. The permittee does not comply with the traffic management plan approved by the Director;

c. To protect the public safety and welfare; or

d. Any other reason authorized by law.

**Bicycle and Pedestrian Work Zone Safety**
**Reasonable Accommodation Guidelines and Definitions**
(Pursuant to Ordinance BL-2016-240 -pending)
06/05/2016

## 1. General:

A public right-of-way occupancy permit that authorizes blockage of a sidewalk, bicycle lane, or other public bicycle or pedestrian path shall require the permittee to provide a safe accommodation for pedestrians and bicyclists. The blockage of a sidewalk, bicycle lane, or other public bicycle or pedestrian path shall be treated in the same manner as the closure of a lane of motor vehicle traffic by applying similar temporary traffic control practices as would be applied to the closure of a lane of motor vehicle traffic for each permit issued. The design and placement of the temporary traffic control signs, devices and roadway markings shall be in compliance with the most recent edition of the Manual on Uniform Traffic Control Devices (MUTCD).

## 2. Accommodation - General:

The accommodation for bicyclists and pedestrians shall maintain the most desirable aspects of the existing facility and shall adhere to the current design guidelines established in the appendices on bicycle and pedestrian design guidelines in the most recent version of the Nashville-Davidson County Strategic Plan for Sidewalks and Bikeways, including the following:

a. Direct and Convenient; provided that closing a sidewalk and routing pedestrians to the sidewalk on the opposite side of the street shall only be approved as a last resort for the duration of time needed to assure pedestrian safety in the absence of other practicable routing options;

b. Obvious; the path is clearly delineated and evident;

c. Separate; Protecting pedestrians from adjacent construction activities, covering the pedestrian walkway when overhead danger is present, and physically separating pedestrians from vehicular traffic with a crash-worthy barrier;

d. Coordinated with signals; and

e. Accessible; complying with the Americans with Disabilities Act of 1990, approved July 26, 1990 (Pub. L. 101-336, 42 U.S.C. §§ 12101 et seq.) and any other standards established by law.

## 3. Reasonable Accommodation for Bicyclists and Pedestrians - Guidelines:

The routing for a reasonable accommodation for bicyclists and pedestrians shall replicate to the extent possible, the safety level and the most desirable aspects of the existing bicycle or pedestrian route, such as by providing:

a. A route that is physically separated from motor vehicle traffic if a protected bicycle lane or other separated bicycle and pedestrian path is blocked or providing a route that is for the exclusive use by bicyclists if a bicycle lane is blocked whenever feasible;

b. A route which is free of obstructions and surface hazards, such as construction equipment, construction materials, debris, holes, mud, loose gravel, milled surfaces and uneven pavement; and

c. A route that does not share a covered or open walkway with pedestrians.

## 4. Reasonable Accommodation - Prioritization Method (Bikeways):

Reasonable accommodation for bicyclists shall be prioritized as follows:

a) Closing a parking lane and keeping the adjacent bicycle lane open;

b) Shifting the bicycle lane to a location on the same roadway to by-pass the work zone or obstruction, and if necessary, shifting and narrowing the adjacent motor vehicle traffic lanes; provided the adjacent motor vehicle travel lanes shall be maintained at no less than ten feet (10 ft.) wide;

c) Closing the adjacent motor vehicle travel lane to provide space for a bicycle lane; provided that a minimum of one (1) motor vehicle travel lane shall remain in the same direction of travel;

d) Merging the bicycle lane and the adjacent motor vehicle travel lane into a shared travel lane adjacent to the work zone or other obstruction, installing sharrow lane markings in the shared travel lane and installing signage directing bicyclists to merge into the shared travel lane; provided the shared travel lane shall be maintained at no less than fourteen feet (14 ft.) wide; and

e) As a last resort, detouring bicyclists onto an adjacent roadway, in which case the detour route shall be adequately signed and replicate, as closely as practicable, the level of safety found on the bicycle route being blocked.

**Definitions**

**Bicycle lane** – a portion of a roadway that has been designated for preferential or exclusive use by bicyclists by pavement markings and, if used, signs.

**Major or Collector Street** ¬¬– any street that has been adopted into the most recent edition of the Major and Collector Street Plan for Nashville and Davidson County.

**MUTCD** – the current edition of the Manual on Uniform Traffic Control Devices for Streets and Highways, Part 6, as approved by the Federal Highway Administration.

**Peak Traffic Hours** –The hours between 6 am and 8 am and between 4 pm and 6 pm Monday through Friday or other hours as documented and noted on approved permit.

**Protected bicycle lane** – a bicycle lane which is physically separated from motor vehicle lanes or is buffered from a motor vehicle lane by a combination of roadway markings and delineator posts.

**Public bicycle or pedestrian path** – a right-of-way under the jurisdiction and control of the Metropolitan Government for use primarily by bicycles and pedestrians.

**Reasonable Accommodation** – A safe and convenient alternative route for pedestrians and bicyclists through or around a work zone or obstruction that is compliant with the latest edition of the MUTCD, the Public Rights-of-Way Accessibility Guidelines of the United States Access Board and all other federal, state, and local legislation and standards.

**Sharrow lane markings** – lane markings which indicate to motorists and bicyclists that the lane is intended to be shared by both motor vehicles and bicycles.

**Sidewalk** – the paved portion of a street between the curb lines or the lateral lines of a roadway and the adjacent property lines intended for the use of pedestrians.

# Appendix 9.C – Low Impact Utility Marking Policy

# ENGINEERING PROCEDURES

| | |
|---|---|
| SECTION:<br>**Engineering** | POLICY **NO.:** |
| SUBJECT:<br>**Low-impact utility marking practices** | EFFECTIVE: January 1, 2020<br><br>PAGE: |
| APPLIES TO:<br>Contractors, Utility Companies, Cable companies and any other whose work requires locate marks in the right-of-way | _ _ NEW ISSUE<br>_ _ x_ _ PARTIAL REVISION<br>___ COMPLETE REVISION |

Purpose:

To ensure the best environmental and safety practices as well as reduce unnecessary and unsightly one-call locate marks and the length of time they remain on the ground and sidewalk after the completion of the job.

Policy:

**Sidewalks**

Chalk paint shall only be used to locate utilities on all sidewalks. The chalk markings are required to be removed by the utility/contractor within 30 days after completion of work and at his cost as a condition of the permit approval process.

**Roadways**

Temporary nonpermanent biodegradable paint or water soluble paint shall only be used to locate utilities on roadways. The temporary paint markings are required to be removed by the utility/contractor within 30 days after completion of work and at his cost as a condition of the permit approval process.

**Other Surfaces**

Flags, stakes or temporary nonpermanent biodegradable paint or water soluble paint shall only be used to locate utilities on other surfaces within the right of way. The flags, stakes or the temporary paint markings are required to be removed by the utility/contractor within 30 days after completion of work and at his cost as a condition of the permit approval process.

REVISION NO.: REVISION

DATE: 10-03-19

ISSUED BY:

# Appendix 9.D – Off-Duty Police Uniform Policy

**Uniform Requirements for Traffic or Police Officers Working at**
**Metro Public Works Permitted Right-of-Way Sites**
*Proposed Uniform Policy Effective February 1, 2014*

Persons obtaining a Right of Way Permit issued by the Metropolitan Department of Public Works who are required to engage the services of a traffic or police officer (as defined in TCA §55-8-109) , as a condition of the permit, shall ensure that every officer is notified of this policy and shall ensure compliance as a condition of the permit.

Uniform Requirements

Every traffic or police officer as defined in TCA §55-8-109) who is engaged in employment related to a Right of Way Permit issued by the Metropolitan Department of Public Works (MPW) shall wear their departmentally approved General Duty Uniform. The wearing of anything other than the General Duty uniform is prohibited unless approved, in writing, by the Director of MPW, or designee.

General Duty Uniform

The General Duty Uniform is the uniform generally worn by officers, in their assigned jurisdiction, while performing law enforcement duties. The following provisions shall apply:

A. The uniform has two (2) classifications: Class A uniform, a uniform generally characterized by a long sleeve shirt and class B Uniform, a uniform generally characterized by a short sleeve shirt worn with an open collar.

B. Uniform apparel shall bear approved insignia to clearly identify officers by their classified ranks or position as employees of the department or their "home jurisdiction", their name shall be clearly displayed on a name strip or name tag, and uniform shall be maintained in a neat, clean, and serviceable condition. Such insignia shall include, in addition to name tag, the badge and any rank or position insignia, and departmental patch or logo.

General Provisions

A. The terms uniform and equipment mean those items of wearing apparel (including uniform insignia items) worn or displayed by employees to identify themselves as members of the department or their "home jurisdiction", and the tools, implements, and other items authorized for use in performing their official duties.

B. For the uniform to be considered acceptable, the wearing apparel specified herein must be worn and otherwise be in compliance with these provisions:

1. Trousers: Must be tailored to a length no shorter than the top of the shoes when wearing "low cut" shoes, and no longer than the top of the heels of the same type shoes when standing in an upright erect position. Shorts or blue jeans are prohibited.
2. Shirts: Must be tailored where the sleeves of long sleeve garments (Class A Uniform) will reach the joint of the wrist. The sleeves shall not be rolled up or under at any time. They shall be in a fully button-down condition. The tail of the garment shall be neatly tucked inside the trousers or skirt at the waist. The collar shall not be turned up or under, or otherwise altered

from the style or position for which it is designed. On a short sleeve shirt (Class B Uniform) only the top button shall be left unfastened, so that the collar will be open at the neck.

3. Uniform Cap, Insulated Cap, Toboggan/Watch Hat, or Ball Cap: If worn, it must be departmentally issued or authorized for wear with the General Duty Uniform. It must be of a size that fits when properly positioned on the head and bear any departmentally required insignia, badge, or logo.
4. Shoes/Boots: Must be departmentally issued or authorized for wear with the General Duty Uniform. They must be clean, polished to a luster, and kept in a serviceable condition. Laces, straps, buckles, zippers, and other approved fastening devices shall be fastened at all times. Only appropriate color socks or hosiery shall be worn with low cut shoes. Sneakers, tennis shoes or athletic type shoes are prohibited.
5. Jackets or Other Outerwear: A jacket or other outerwear, if worn, shall be the department issued or approved garment for wear with the General Duty Uniform and shall bear the department's shoulder patch and badge, the name of the wearer must be displayed on the garment.
6. Departmentally Issued Identification Card: Every traffic and police officer, while engaged in employment at a MPW permitted Right of Way worksite, shall possess and display, upon demand by any MPW employee, Metropolitan Police Officer, or citizen, the identification card issued to them by the department.

Reflective Traffic Vests

The use of high-visibility clothing while at a right of way worksite or engaged in the manual direction of traffic, enhances officer safety as well as driver recognition and response. Therefore, on all MPW permitted Right of Way work sites, traffic and police officers shall wear an ANSI approved reflective vest. The vest shall be of the style, color, and specification to meet the current recognized safety standards as adopted by the department or otherwise required by law. The vest shall bear the words “POLICE” and/or include "POLICE" and the officer's agency name. To be considered an acceptable reflective vest, it shall have a label which includes statement(s) that it complies with: “ANSI/ISEA 107-2004”, “ANSI/ISEA 107-2010”, or "ANSI/ISEA 207-2006”.

**55-8-109. Obedience to any required traffic-control device.**

**...**

**(c)** For purposes of this section, "traffic or police officer" means every officer authorized to direct or regulate traffic or to make arrests for violations of traffic regulations or a person licensed under title 62, chapter 35, who is retired in good standing from being a commissioned, POST-certified law enforcement officer and who has notified the chief law enforcement officer in the jurisdiction where the retired officer will be directing or regulating traffic at least twenty-four (24) hours in advance, or as soon as possible in the event of an emergency, prior to performing traffic control functions in such jurisdiction.

...

Appendix 9.E – MPW Engineering ROW Closure Policy

# ENGINEERING PROCEDURES

| SECTION: **Utilities and Permits** | POLICY NO.: |
|---|---|
| SUBJECT: **Closure Permits** | EFFECTIVE:<br><br>PAGE: |
| APPLIES TO: **Any work Performed in the Right of Way** | ___ NEW ISSUE<br>__X__ PARTIAL REVISION<br>___ COMPLETE REVISION |

PURPOSE:

To issue and regulate temporary closures in the right of way such as sidewalks, alleys, streets or any other public right of way, including blocking permits for trailers and dumpsters. (Ref. Chapter 13.20 of the Excavation and Obstructions Code)

POLICY:

1. All traffic control signs, signals, and devices shall conform to the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, published by the United States Department of Transportation Federal Highway Administration.
2. The Department of Public Works will take reasonable care and precautions to insure that a work site is made as safe as possible by whatever means available to protect the public as well as the workers.
3. Temporary traffic control signs, signals and devices shall function to move traffic safely and provide clear guidance to drivers and pedestrians as they travel through the temporary traffic control zone.
4. The Department of Public Works may require the use of off-duty sworn peace officers, as defined and specified in Tenn. Code Ann. §§ 62-35-102(18) and 62-35-103(a)(15)(B), for traffic control where appropriate. Officers must be in uniform. Officers from jurisdictions other than the Metropolitan Police Department must be in compliance with the requirements of Tenn. Code Ann. § 62-35-141 and all other applicable statutes, rules and regulations. When a permit issued by the Department of Public Works requires an off-duty police officer, the officer must be present at the work site and actively engaged in the control of traffic.
5. If pedestrian travel paths (sidewalks or footpaths) are closed or disrupted by a construction, maintenance, or utility operation, then pedestrian traffic control will be required. This includes the use of signs, channelization devices, flags, etc., to direct pedestrian movement thorough or around the work site.
6. Permitee is responsible for compliance with all codes, local, state and federal laws. Work zones are dynamic and require constant attention. Permitee is responsible for ensuring the safety of the permitted site.

PROCEDURES:

1. Person requests street closure permit and/or blocking permit by telephone, fax, or in person to the Department of Public Works Permit Office. Notification shall be at least 24 hours in advance.

2. Request includes location and terminii, reason for closure and length of time for closure. Requests in major rights of way or for traffic rerouting may require a traffic control plan that must be approved before the permit is issued.

3. Place time restrictions on hours of work and on closure itself, if appropriate, on permit according to vehicular traffic and pedestrian traffic in area to be closed.

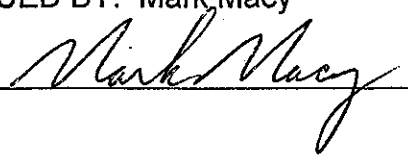
4. Require contractor to arrange for an off-duty police officer to help maintain traffic flow and ensure pedestrian safety, if necessary.

5. Require contractor to set up advanced warning such as signs, barricades, etc. in conjunction with the Manual on Uniform Traffic Control Devices (MUTCD).

6. Record request in computer and street closure permit book. Send copies to the Police and Fire Departments, the School Board and MTA.

7. Inspect the site, if necessary, to ensure proper safety devices are used and to enforce all requirements of the permit.

ORIGINAL: Issued by Rick Conner, Aug. 25, 2003

| | |
|---|---|
| REVISION NO.: 1<br><br>REVISION DATE: Sep. 28, 2011 | ISSUED BY: Mark Macy<br>  |

**Tenn. Code Ann. § 62-35-102** (Copy w/ Cite) Pages: 3

*Tenn. Code Ann. § 62-35-102*



*** CURRENT THROUGH THE 2010 REGULAR SESSION ***

Title 62 Professions, Businesses and Trades
Chapter 35 Private Protective Services Licensing and Regulatory Act

Tenn. Code Ann. § 62-35-102 (2011)

**62-35-102. Chapter definitions.**

As used in this chapter, unless the context otherwise requires:

**(1)** "Armed security officer/guard" means a security officer/guard who at any time wears, carries, possesses or has access to a firearm or any facsimile of any firearm that may leave the impression that the person is armed and who works in plainclothes or wears dress of a distinctive design or fashion or dress having any symbol, badge, emblem, insignia or device that identifies or tends to identify the wearer as a security officer/guard;

**(2)** "Branch manager" means the individual who is immediately responsible for the operation of a branch office;

**(3)** "Branch office" means any office of a contract security company within this state other than its principal place of business within this state;

**(4)** "Certified trainer" means any individual certified by the commissioner as qualified to administer and certify to successful completion of the minimum training requirements prescribed by this chapter for a security guard/officer;

**(5)** "Commissioner" means the commissioner of commerce and insurance or the commissioner's designee;

**(6)** "Contract security company" means any person engaging in the business of providing or undertaking to provide a security guard and patrol service on a contractual basis for another person;

**(7)** "Licensee" means any contract security company licensed in accordance with this chapter;

**(8)** "Person" means any individual, firm, association, company, partnership, corporation, nonprofit organization, institution or similar entity;

**(9)** "Principal corporate officer" means the chief executive officer, president, vice president, treasurer, secretary or comptroller, as well as any other responsible officer or executive employee who performs functions for the corporation corresponding to those performed by the chief executive officer, president, vice president, treasurer, secretary or comptroller;

**(10)** "Proprietary security organization" means any person or department of the organization that employs a security guard/officer solely for the person in an employer/employee relationship;

**(11)** "Qualifying agent" means a principal corporate officer meeting the qualifications set forth in this chapter for operating a contract security company;

**(12)** "Qualifying manager" means an individual designated by a proprietary security organization to be responsible for compliance with this chapter on behalf of the organization;

**(13)** "Registrant" means an individual who holds a valid registration card;

**(14)** "Registration card" means a pocket card issued by the commissioner evidencing that the holder has met the qualifications required by this chapter to perform the duties of a security guard/officer in this state;

**(15)** "Security guard/officer" means an individual employed by a contract security company or a proprietary security organization whose primary duty is to perform any function of a security guard and patrol service;

**(16)** "Security guard and patrol service" means protection of persons or property, or both, from criminal activities, including, but not limited to:

**(A)** Prevention or detection, or both, of intrusion, unauthorized entry, larceny, vandalism, abuse, fire or trespass on private property;

**(B)** Prevention, observation or detection of any unauthorized activity on private property;

**(C)** Enforcement of rules, regulations or local or state laws on private property;

**(D)** Control, regulation or direction of the flow or movements of the public, whether by vehicle or otherwise on private property; or

**(E)** Street patrol service;

**(17)** "Street patrol service" means the utilization of foot patrols, motor patrols or any other means of transportation in public areas or on public thoroughfares in order to serve multiple customers or facilities. "Street patrol service" does not apply to:

**(A)** A management supervisor moving from one (1) customer or facility to another to inspect personnel; or

**(B)** A security guard/officer traveling from one (1) facility to another to serve the same customer with multiple facilities;

**(18)** "Sworn peace officer" means any individual who derives plenary or special law enforcement powers, such as the power of arrest, from, and is an employee of, a federal, state, or local governmental agency or instrumentality;

**(19)** "Unarmed security officer/guard" means a security officer/guard who never wears, carries or has access to a firearm or any facsimile of a firearm that may leave the impression that the person is armed with a firearm, but who may carry other nonlethal devices as prescribed in this chapter with the proper certification and who works in plainclothes or wears dress of a distinctive design or fashion or dress having any symbol, badge, emblem, insignia, or device that identifies or tends to identify the wearer as a security officer/guard; and

**(20)** "Undercover agent" means an individual hired by another person, through a contract security company to perform a job in or for that person, and while performing the job, to act as an undercover employee, independent contractor or operative of the person, but under the supervision of the contract security company.

**HISTORY:** Acts 1987, ch. 436, § 2; 1988, ch. 987, § 1; 1996, ch. 1009, §§ 5-7, 28; 1997, ch. 391, § 1.

**Tenn. Code Ann. § 62-35-102** (Copy w/ Cite) Pages: 3

In

**Tenn. Code Ann. § 62-35-103** (Copy w/ Cite) Pages: 4

*Tenn. Code Ann. § 62-35-103*



Title 62 Professions, Businesses and Trades
Chapter 35 Private Protective Services Licensing and Regulatory Act

Tenn. Code Ann. § 62-35-103 (2011)

**62-35-103. Exemptions from chapter provisions.**

**(a)** This chapter does not apply to:

**(1)** A government officer or employee performing official duties;

**(2)** A consumer reporting agency, as defined by the Federal Fair Credit Reporting Act, compiled in 15 U.S.C. § 1681 et seq.;

**(3)** An attorney at law or the attorney's agent performing duties relating to the attorney's practice of law;

**(4)** An insurance company, agent, broker or adjuster performing investigative duties in connection with insurance business transacted;

**(5)** A holder of a purchase money security interest or the holder's agent repossessing the personal property in which the interest is held;

**(6)** A private business employee conducting investigations relating to the internal affairs of the business;

**(7)** A full-time sworn peace officer receiving compensation for services as a guard, patrol or watchperson under a contract with a private business that is properly licensed by the state;

**(8)** An unarmed employee, whether uniformed or nonuniformed, in the course and scope of employment of a hospital who exceeds all training requirements established in § 62-35-118 by having received no less than twelve (12) classroom hours of training. The course curriculum for the training shall be on file with the commissioner;

**(9)** Private entities contracting with governmental entities for the care, supervision or transportation of inmates. This exemption shall in no way authorize government contracts for the care, supervision or transportation of inmates;

**(10)** A private special deputy appointed pursuant to § 38-8-118;

**(11)** A special deputy appointed pursuant to § 8-8-212 or a special police officer appointed by the chief of police in a county having a metropolitan form of government and a population in excess of five hundred thousand (500,000), according to the 1990 federal census or any subsequent federal census;

**(12)** A retired peace officer receiving compensation for services as a guard, patrol or

watchperson under a contract with a private business that is properly licensed by the state; provided, that the retired peace officer:

**(A)** Completes the firearms and marksmanship training required by § 62-35-118(b); and

**(B)** Has a written directive issued by the executive supervisor of the organization to which the person was attached or employed authorizing the person to carry a handgun;

**(13) (A)** One (1) designated employee per business location of a private company, firm, partnership or corporation that is not a contract security company or proprietary security organization whose duties include those of an unarmed security guard/officer during nonbusiness hours;

**(B)** Pursuant to this subdivision (a)(13), no person, while performing any function of a security guard and patrol service during nonbusiness hours, shall:

**(i)** Wear or display any badge, insignia, shield, patch or pattern that:

**(a)** Indicates or tends to indicate that the person is a sworn peace officer;

**(b)** Contains or includes the word "police" or the equivalent of that word; or

**(c)** Is similar in wording to any law enforcement agency in this state; or

**(ii)** Have or utilize any vehicle or equipment that:

**(a)** Displays the words "police," "law enforcement officer," or the equivalent of those words; or

**(b)** Has any sign, shield, accessory or insignia that may indicate that the vehicle or equipment belongs to a public law enforcement agency;

**(14)** A special police officer appointed by a chief of police or by the sheriff in any county having a population of no less than one hundred fifty-three thousand (153,000) nor more than one hundred fifty-three thousand one hundred (153,100), according to the 2000 federal census or any subsequent census. A special police officer appointed pursuant to this subdivision (a)(14) shall have qualifications that are equivalent or superior to those required for a law enforcement officer under the standards established by the peace officer standards and training commission for law enforcement officers; or

**(15) (A)** A company using or providing certified law enforcement officers to others exclusively for traffic control purposes within temporary work zones located in the public right-of-way and established in accordance with the manual on uniform traffic control devices (MUTCD); provided, however, that any department providing the law enforcement officers may require the company to have on staff a traffic control supervisor or a traffic engineer in order to insure compliance with the MUTCD and may also require the company to demonstrate proof of liability insurance; or

**(B)** Commissioned, uniformed police officers, state troopers and/or sheriff deputies, upon departmental approval, are authorized, regardless of primary jurisdiction, to direct traffic in departmental approved uniforms or utilizing other governmental equipment, as may be required, in temporary work zones or for incident management purposes, to meet the needs of and control all road users, whether motorists, bicyclists, or pedestrians, within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130, upon any public roadway located within the state.

**(b) (1)** Section 62-35-118(a), only, shall not apply to a person employed as an unarmed security guard/officer by a proprietary security organization.

**(2)** For the purposes of this subsection (b), an unarmed security guard/officer shall not carry a weapon of any kind.

(3) It is the desire of the general assembly that unarmed proprietary security guards/officers whose primary duties involve contact with the public should have training in the areas of legal powers and limitations and of emergency procedures as deemed necessary by their employers. The commissioner may provide the employers information concerning these areas.

**HISTORY:** Acts 1987, ch. 436, § 3; 1988, ch. 987, § 2; 1989, ch. 142, § 1; 1990, ch. 816, §§ 1, 2; 1996, ch. 1009, §§ 8, 9; 1997, ch. 118, § 1; 1997, ch. 137, § 1; 1997, ch. 274, § 1; 1998, ch. 865, § 1; 2001, ch. 452, § 2; 2002, ch. 590, § 1; 2004, ch. 661, § 2; 2006, ch. 862, § 4; 2006, ch. 1013, § 5.

**Tenn. Code Ann. § 62-35-141** (Copy w/ Cite) Pages: 2

*Tenn. Code Ann. § 62-35-141*



Title 62 Professions, Businesses and Trades
Chapter 35 Private Protective Services Licensing and Regulatory Act

Tenn. Code Ann. § 62-35-141 (2011)

**62-35-141. Notification and uniform requirements for peace officers providing security outside of primary jurisdiction.**

**(a) (1)** Notwithstanding any provision of this chapter to the contrary, if a full-time sworn peace officer is working to provide uniformed security, direct traffic, exercise crowd control or perform any other such duty in a jurisdiction other than the officer's primary jurisdiction, then the chief law enforcement officer of the jurisdiction in which the full-time sworn peace officer is working shall be notified of the location of the officer's assignment as well as the length of the assignment. For work performed in unincorporated areas of a county or within the limits of a municipality that does not maintain a police department, the chief law enforcement officer of the jurisdiction is the county sheriff. For work performed within the limits of a municipality that maintains a police department, the chief law enforcement officer of the jurisdiction is the municipal police chief.

**(2)** Notice shall be provided in writing by the employer of the full-time sworn peace officer within five (5) days prior to the date of first service, unless other arrangements are made with the chief law enforcement officer of the jurisdiction.

**(b) (1)** While a full-time sworn peace officer certified pursuant to § 38-8-107 is employed in a jurisdiction other than the full-time sworn peace officer's primary jurisdiction, the officer's clothing shall bear insignia and markings clearly designating that the peace officer is a private duty law enforcement officer. The Tennessee peace officer standards and training commission, created by title 38, chapter 8, part 1, shall establish design criteria for the insignia and markings.

**(2)** Notwithstanding subdivision (b)(1), a full-time sworn peace officer certified pursuant to § 38-8-107, while employed in a jurisdiction other than the officer's primary jurisdiction, may wear the primary jurisdiction's uniform, if the jurisdiction has authorized its officers to do so. The jurisdiction may establish reasonable regulations for the wearing of its uniforms during the employment.

**(c)** This section shall only apply to sworn peace officers engaged in employment outside their primary jurisdiction and within a county having a:

**(1)** Metropolitan form of government and a population greater than one hundred thousand (100,000), according to the 2000 federal census or any subsequent federal census; or

**(2)** Population of no less than one hundred eighty-two thousand (182,000) nor greater than one hundred eight-three thousand (183,000), according to the 2000 federal census or any subsequent federal census.

**HISTORY:** Acts 2002, ch. 846, § 1; 2003, ch. 222, § 1.

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**Tenn. Code Ann. § 62-35-141** (Copy w/ Cite)

Pages: 2

In

# Appendix 9.F – Utility Cut Repair Guidelines and Specifications for the Permitting Process (Appendix D Long Range Paving Plan)

# APPENDIX D

# UTILITY CUT REPAIR GUIDELINES AND SPECIFICATIONS FOR THE PERMITTING PROCESS

## D.1 OVERVIEW OF UTILITY CUT ISSUES

In recent years, utility owners have increasingly chosen to take their distribution networks underground. According to a 1997 report published by APWA, "Managing Utility Cuts",

> "The issues surrounding the management of utility cuts are as varied as the cuts are numerous. As the demand for greater access to the right of way increases, so will the need for better coordination of multi-agency schedules and a higher level of accountability for employing less intrusive, more durable and cost efficient methods for making utility cuts."

This has certainly been the experience of Nashville.

As a result, several cities across the nation have undertaken projects to make fair and uniform assessment of the damage due to utility cuts, and to assess an appropriate fee schedule to recover the damages. Additionally, research has been conducted to establish a more "engineered" approach to repairing the cuts. In other words, agencies are adopting a "do it right the first time" specification.

This study researched current practices and reviewed other agency specifications, then used these findings to develop a guide to utility cut management. The findings and recommendations are presented in three parts:

- Current Practices within MPW
- Process Used to Identify Level of Utility Degradation
- Specifications and Construction Guidelines for Trench Repair

## D.2 CURRENT PRACTICES IN MPW

In 1997, MPW amended Chapter 13.20, Excavations and Obstructions, of the Metropolitan Code of Laws in an attempt to increase the service life of the MPW's pavement network. This amendment, enacted through Ordinance 97-785, Excavations and Obstructions, now requires that any pavement surface removed or damaged as a result of an excavation must be replaced by, and at the expense of, the person or organization responsible for making the excavation. In addition, a reputable paving contractor must perform the repair in accordance with the requirements and specifications of the Department, and the repair can only be performed in the presence of a Department inspector.

The applicable specification for pavement repair on MPW roads and streets is contained in Section 02575, Pavement Repair, of the MPW Standards. Specifically, Paragraph 3.9 stipulates that full lane or roadway width milling and/or paving is required where successive or continuous excavations are planned so as not to "checkerboard" the repair and to provide a

smooth riding surface. The length of full width milling and/or paving is to be from manhole to manhole centerline from the first excavation point to the last. In addition, if the excavation is within 300 feet of an intersection, the repair limits are to be extended to the radius point of the intersection.

According to Section 13.20.030.D.1 of the Metro Code, an excavation permit is required for each separate excavation. A single excavation is defined as having a maximum area of 6 square yards or a maximum length of 33 ft. Excavations having an area or length greater than these limits must be separated into two or more excavations, each requiring its own permit. In addition to the permit fee, an excavation made in a pavement surface less than 5 years old is assessed a fee of $500 plus 20% of the average cost to repair the excavation according to MPW specifications

In 2001, the Department issued a contract to IMS/Terracon, a pavement management consultant, to study the impact of utility cuts on the service life of MPW pavements and to develop a fee schedule for excavation permits that would prorate the cost of repairing excavations among the permit holders who damaged the surface (Development of a Street Damage Restoration Fee Schedule for the Metropolitan Government of Nashville and Davidson County, Terracon, February 2001). The fee schedule was designed to recoup the cost of milling and paving an entire block once the surface condition deteriorated to a specified level. The fee schedule was also weighted based on the age of the surface, with higher fees charged for excavations in newer pavements. This fee schedule, however, was never implemented.

### D.2.1 Specification Issues

The current specification for pavement repair, Section 02575, specifies high-quality materials and procedures. The IMS/Terracon study concluded that repairs made in accordance with this specification were actually stronger than the surrounding pavement. The major concern expressed by the Department staff with this specification lies in the lack of enforcement of Paragraph 3.9. Utility companies are not being required to mill and pave full width between successive cuts or along continuous cuts or between cuts and to intersections 300 feet or less in proximity.

Part of the problem lies in the wording of this provision. Rarely does a utility plan for and request permits for multiple cuts within the same block. The most common scenario involves a request for a single cut within a block that already contains one or more cuts; there is no provision to have the utilities mill and/or pave full width between the proposed cut and an existing cut. Two options were presented in the Terracon report to MPW to address the ride quality and aesthetics issues posed by utility cuts.

Option 1 is to amend Paragraph 3.9 of the Pavement Repair specification to require full width milling and paving between the proposed cut and any existing cut within 10 feet. The suggested 10-foot length will prevent numerous adjacent small repairs that deteriorate ride quality, appearance and overall performance. Of course, this option is viable only if it is enforced, but nearly 100 percent compliance should be achievable if the issuance of future permits to a given utility is tied to their past compliance with the specification.

Option 2 is to implement the fee schedule proposed in the IMS/Terracon report. On the average, this option would generate sufficient funds to repave an entire block once 15 percent of the block's surface area is affected by a utility cut repair. The proposed fees are easily calculated

from the information contained in the permit application and the pavement management system database, and the fees should be easy to collect if issuance of the permit is tied to payment of the fees. The higher fees will be cheaper for the utilities than the extensive paving required by Option 1. The significantly higher permit fees will likely be strongly opposed by the utilities.

Option 1 is recommended because it offers the path of least resistance in meeting the goal of smoother riding pavement surfaces. The specification is already in place, so a small amendment should not be too difficult to accomplish. The amendment should be accomplished prior to the start of enforcement. The utilities likely would voice opposition to the sudden enforcement of the current specification, so opposition to enforcement of the amended specification can certainly be expected.

### D.2.2 Performance of Utility Cut Repairs

Utility cuts, like other patches, cause damage that reduces the level of service of the street. This is not a new concept, but one that pavement engineers have dealt with since cuts in the pavement right-of-way to bury utilities have been allowed. The surface condition rating method selected by MPW, ASTM D6433, includes a serviceability deduct value for the presence of a utility cut. This deduct value is comparable in severity to the deduct values assigned for longitudinal and transverse cracking. The problem is not one of "does the cut damage the pavement," but rather, "how can the impacts be quantified as to costs and how do these translate into reasonable and defensible fees?"

In 2002, the Construction Practices Subcommittee of the APWA was assigned to research available documents related to pavement degradation caused by utility cuts. A summary of the major findings of their literature review follows:

- Factors influencing the performance of a patch include the pavement material, soil conditions, climate, traffic and repair techniques. These roughly correlate with the same factors influencing the life of a new pavement.
- Poor construction techniques, such as rocking the jackhammer while cutting the boundary of the patch, can damage the area adjacent to the cut and further degrade the patch and surrounding pavement. Studies showed this zone of influence to be 1.5 to 6 feet beyond the patch.
- Pavement cut repairs made using quality materials and sound engineering and construction techniques tend to perform as well as the surrounding pavement.
- Poor performance of the patch tends to be a result of inadequate compaction of the materials, insufficient thickness of materials, poor quality of materials, and damage to the side of the cut.
- Most of the reports included a cost analysis associated with the cuts ranging from $2 per square yard to $540 per square yard.
- The estimated reduction in pavement life due to a utility cut was found to be from 20 to 56% of the original life of the pavement.

These observations are consistent with the findings of the Terracon report and with other studies such as the Salt Lake City report (*Public Works*, April 2002) where structural testing was used to quantify the degradation caused by a utility cut. The Terracon report suggested the unit

rate for pavement overlay was $21.67 per square yard. Further it was determined that the fees for recovery should be prorated due to the age of the pavement, and that new pavements should have the highest rate of recovery. A full table of fees is found in the Terracon report.

The Salt Lake City report used deflection tests with an FWD (Falling Weight Deflectometer) to prove that the zone of influence or damage beyond the visual limit of the trench was at least 2 feet. It was suggested that a "T" patch (replaces surface course at least 2 feet beyond trench boundaries) be used to compensate for this damage. Additional suggestions were made for selecting the cut boundaries. Other somewhat intangible costs were discussed, but no consensus seemed to exist for recovery of these costs. They include traffic disruption, safety of repair personnel, emergency vehicle response times due to rough patches and others.

The findings of the report prepared by Terracon are consistent with those of other agencies, and it is recommended that these findings be used in developing MPW's specification and permit fee policy.

## D.3 CONSTRUCTION GUIDELINES FOR TRENCH REPAIR

Chapter 13.20 of the Metro Code has been cited as a model by the APWA and referenced in many of the articles studied for this report. Therefore, it is recommended that the current code be modified to include recent improvements in practice being used by other municipalities. The requirement for patch awareness and repair training and a specification for the "T" patch are also submitted for adoption. The recommended modifications are summarized as follows:

### D.3.1 Requirements for Training

Recognizing that education and awareness by the utility companies as to the impact of their cuts on pavement life and the quality of the community is needed, it is suggested that representatives from utility companies and contractors be required to attend a ½-day workshop on patching utility cuts. This workshop would cover the impacts of cuts on street performance and the associated economic burden on the community as well as proper utility cut procedures. The workshop should be based on the Strategic Highway Research Program manuals of practice and include the rating tree procedure. The presence of a workshop graduate would be required to perform a utility cut or utility cut repair.

### D.3.2 T-Patches

T-Patches are pavement cuts made outside the trench boundaries so there is not a continuous vertical shear plane from the edge of the trench to the pavement surface. Research shows that the zone of influence is at least 2 feet from the edge of the trench. To take advantage of the layering effects of a flexible pavement, the compacted base and the surface course should be extended at least 2 feet from the edge of the trench. This design minimizes the reflective cracking due to excessive strains at the bottom of each layer at the edge of the trench and allows better compaction of the base material and new HMAC. Diagrams for typical T-patches are shown below as Figure D.1 shows the details or trench repairs in both the crossing (transverse) direction and parallel (longitudinal) direction. Figures D.2 and D.3 are notes that comprise part of the specifications for the flush trench repairs and support the details in Figure D.1. Figures D.5 and D.6 are notes that comprise part of the specifications for the recessed trench repairs and support the details in Figure D.4. Figure D.7 provides details for trench repairs outside the roadway. Figure D.8 provides details for temporary patch.

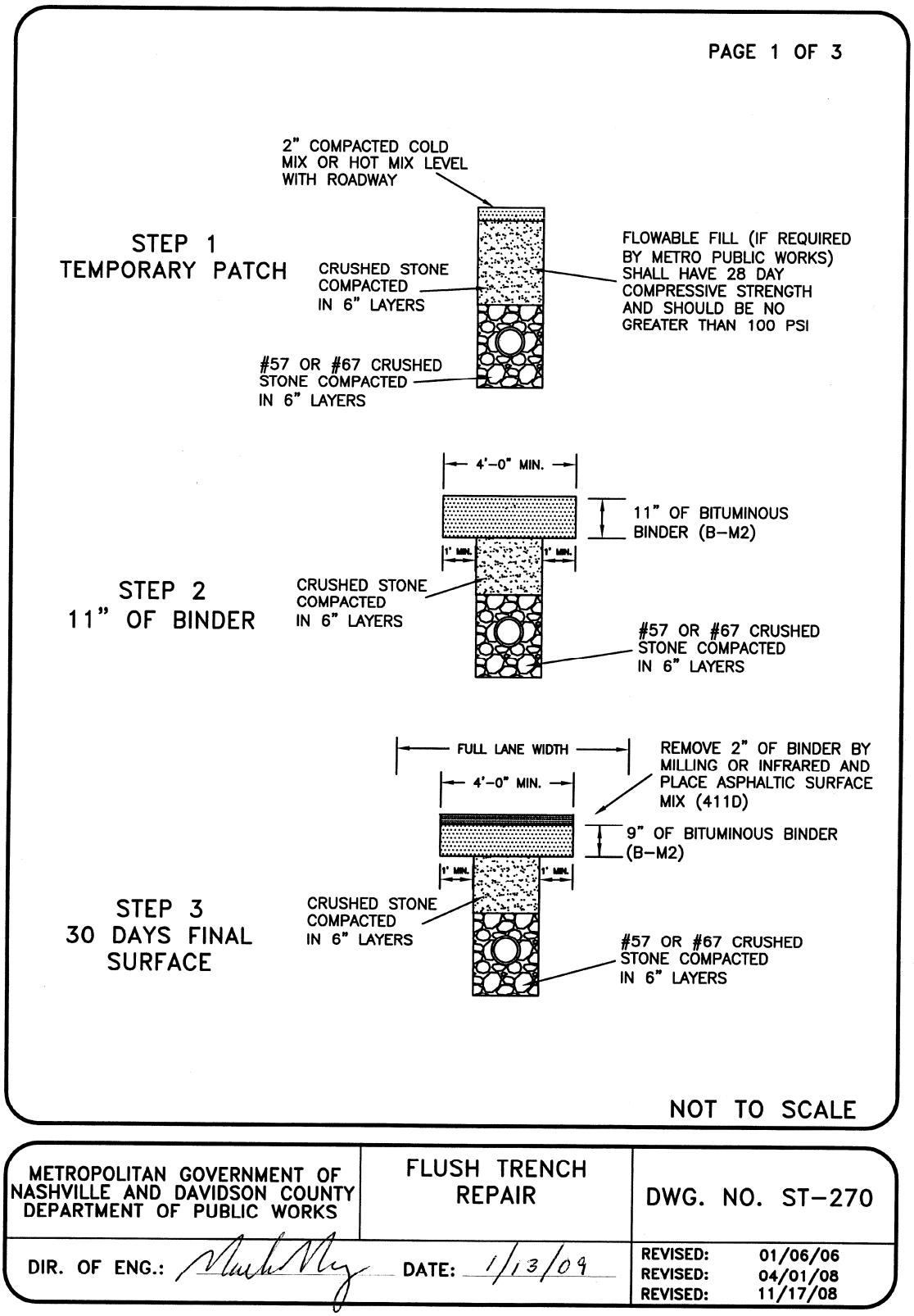



Figure D.1 Details of a flush trench repair.

GENERAL NOTES PAGE 2 OF 3

1. PRIOR TO PLACEMENT OF CRUSHED STONE OR FLOWABLE FILL THE DEPARTMENT OF PUBLIC WORKS PERMITS OFFICE WILL BE NOTIFIED AND AN INSPECTION OF THE TRENCH WILL BE MADE BY A REPRESENTATIVE OF THE DEPARTMENT OF PUBLIC WORKS PERMITS OFFICE. AT THE COMPLETION OF THE INSTALLATION OF THE CRUSHED STONE OR FLOWABLE FILL, THE DEPARTMENT OF PUBLIC WORKS PERMITS OFFICE WILL BE NOTIFIED AND AN INSPECTION OF THE BACKFILL WILL BE MADE BY A REPRESENTATIVE OF THE DEPARTMENT OF PUBLIC WORKS. AFTER ACCEPTANCE OF THE BACKFILL BY THE REPRESENTATIVE OF THE DEPARTMENT OF PUBLIC WORKS PERMITS OFFICE, THE ASPHALT PAVEMENT CAN BE APPLIED.

2. INSPECTION PERSONNEL OF THE DEPARTMENT OF PUBLIC WORKS SHALL BE NOTIFIED BY CONTRACTOR/PERMITEE AT LEAST TWO (2) DAYS PRIOR TO REQUEST FOR INSPECTION.

3. THE WORK PERFORMED SHALL BE FREE FROM WORKMANSHIP DEFECTS FOR A PERIOD OF ONE (1) YEAR AFTER THE DATE OF ACCEPTANCE BY THE DEPARTMENT OF PUBLIC WORKS PERMIT OFFICE.

4. EXISTING PAVEMENTS, BASES, CURBS & GUTTERS AND SIDEWALKS SHALL BE CUT AND BROUGHT TO A NEAT LINE BY USE OF AN AIR HAMMER, SAW OR OTHER SUITABLE EQUIPMENT. EXPANSION JOINTS REMOVED SHALL BE REPLACED

5. THE MINIMUM WIDTH TO BE TRIMMED ON EACH SIDE OF THE TRENCH LINE, AS SEEN IN THE SECTION MAY BE WAIVED OR AMENDED UPON APPROVAL OF THE METRO INSPECTOR, HOWEVER, A MINIMUM WIDTH OF REPLACEMENT SHALL BE 4'-0" TO ALLOW FOR A ROLLER.

6. IF PERMANENT PAVEMENT REPAIRS CANNOT BE MADE WITHIN THREE (3) DAYS, THEN TEMPORARY REPLACEMENT SHALL BE MADE WITH 2" COLD MIX OR HOT BITUMINOUS SEAL COAT OVER COMPACTED CRUSHED STONE. PERMANENT PAVEMENT REPAIR TO BE COMPLETED WITHIN THE TIME PERIOD AS PER METRO CODE 13.20.

7. ALL EXCAVATIONS MADE WITHIN PUBLIC RIGHT-OF-WAY REQUIRE EXCAVATIONS AND STREET CLOSURE PERMITS FROM THE DEPARTMENT OF PUBLIC WORKS PRIOR TO COMMENCING WORK AS PER METRO CODE 13.20.

8. FLOWABLE FILL WILL BE REQUIRED ON ALL ARTERIALS, COLLECTORS AND DOWNTOWN STREETS. FLOWABLE FILL SHALL MEET THE REQUIREMENTS IN TENNESSEE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS SECTION 204, EXCEPT AS MODIFIED BY PUBLIC WORKS TECHNICAL SPECIFICATIONS 02225, LATEST REVISION.

9. IN THE EVENT OF ANY CONFLICT, DISCREPANCY, OR INCONSISTENCY AMONG THE PLANS AND THESE STANDARD DETAILS, THE REQUIREMENTS OF THE STANDARD DETAILS SHALL GOVERN.

10. ALL REPAIRS SHALL INCLUDE FULL LANE WIDTH RESURFACING EXCEPT WHEN UTILIZING INFRARED TECHNOLOGY. SEE INFRARED SPECIFICATIONS ATTACHED. THERE WILL BE A MAXIMUM OF 40 FT LONGITUDINAL REPAIR WHEN USING INFRARED TECHNOLOGY ON AN EXCAVATED PATCH.

11. ALL REPAIRS SHALL UTILIZE A 1-FOOT CUTBACK ON ALL SIDES EXCEPT THE EDGE OF PAVEMENT.

NOT TO SCALE

| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | FLUSH TRENCH REPAIR NOTES | DWG. NO. ST-270a |
|---|---|---|
| DIR. OF ENG.: Mark Macy DATE: 12/8/08 | | REVISED: 07/31/02<br>REVISED: 09/10/04<br>REVISED: 11/17/08 |

Figure D.2. Page 1 of notes pertaining to a flush trench repair.

PAGE 3 OF 3

GENERAL NOTES CONTINUED:

12. NEW UTILITY CUTS WILL BE MILLED AND PAVED TO ANY EXISTING UTILITY CUT OR DAMAGED PAVEMENT WITHIN 10–FEET. IF EXISTING CUT OR DAMAGED PAVEMENT IS LESS THAN 10–FEET IN LENGTH, THE EXISTING CUT OR DAMAGED PAVEMENT SHALL ALSO BE MILLED AND PAVED.

13. ASPHALT REPAIR ADJACENT TO CURB AND GUTTER ALONG A ROADWAY GREATER THAN 24–INCHES SHALL HAVE FULL LANE WIDTH PAVING.

14. WHEN GRADED STONE (I.E. #57, #67, #78 STONE) IS USED THERE IS GENERALLY NO COMPACTION EQUIPMENT REQUIRED. THE MATERIAL DOES, HOWEVER, NEED TO BE PUT IN THE TRENCH IN APPROXIMATELY 12–INCH LIFTS.

15. GRADED STONE PLACED IN TRENCH SHOULD BE CAPPED WITH 8 TO 12–INCHES OF PUG MIX (MIX IS ESSENTIALLY TYPE A BASE, GRADE D, OR MORE COMMONLY KNOWN AS "CRUSHER RUN"). SEE TDOT STANDARD SPECIFICATION 303.07.

16. TYPE "A" BASE, GRADE "D" CAN BE USED FOR THE ENTIRE BACKFILL AND COMPACTED BY MECHANICAL METHODS IN NO MORE THAN 6–INCH LIFTS AS PROVIDED IN SECTION 204.11 OF TDOT STANDARD SPECIFICATIONS.

17. THE PUG MIX SHOULD BE COMPACTED IN 6–INCH LIFTS WITH A STEEL SHELL ROLLER OR OTHER MECHANICAL VIBRATORY COMPACTION EQUIPMENT. SEE TDOT STANDARD SPECIFICATIONS 303.08 AND 303.09. MATERIAL SHOULD BE ALLOWED TO CURE UNTIL ALL THE MOISTURE IS GONE FROM STONE (USUALLY 24–48 HOURS).

18. THE TRENCH SHOULD THEN HAVE 11–INCHES OF BINDER PLACED LEVEL WITH THE ROADWAY IN A MINIMUM OF TWO (2) LIFTS AND COMPACTED WITH MECHANICAL COMPACTION EQUIPMENT.

19. THE BINDER SURFACE SHALL BE MILLED OR HEATED USING INFRARED TECHNOLOGY TWO 2–INCHES IN DEPTH AND REPLACED WITH TWO (2) INCHES OF SURFACE MIX AND COMPACTED WITH MECHANICAL COMPACTION EQUIPMENT.

20. INTERSECTION REPAIRS WILL ONLY REQUIRE FULL LANE WIDTH PAVING.

22. ANY DISTURBED PAVEMENT MARKINGS MUST BE RESTORED TO CURRENT METRO STANDARDS.

23. DIAGONAL REPAIRS WILL BE REQUIRED TO BE SQUARED OFF AND MILLED AND PAVED. NO INFRARED TECHNOLOGY ALLOWED ON THIS TYPE OF REPAIR.

24. ALL LONGITUDINAL REPAIRS MORE THAN 40 FT IN LENGTH WILL BE REQUIRED TO BE MILLED AND PAVED.

NOT TO SCALE

| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | FLUSH TRENCH REPAIR NOTES | DWG. NO. ST–270b |
|---|---|---|
| DIR. OF ENG.: Mark Macy | DATE: 12/2/08 | REVISED: 03/31/06<br>REVISED: 11/17/08<br>REVISED: |

Figure D.3. Page 2 of notes pertaining to a flush trench repair.

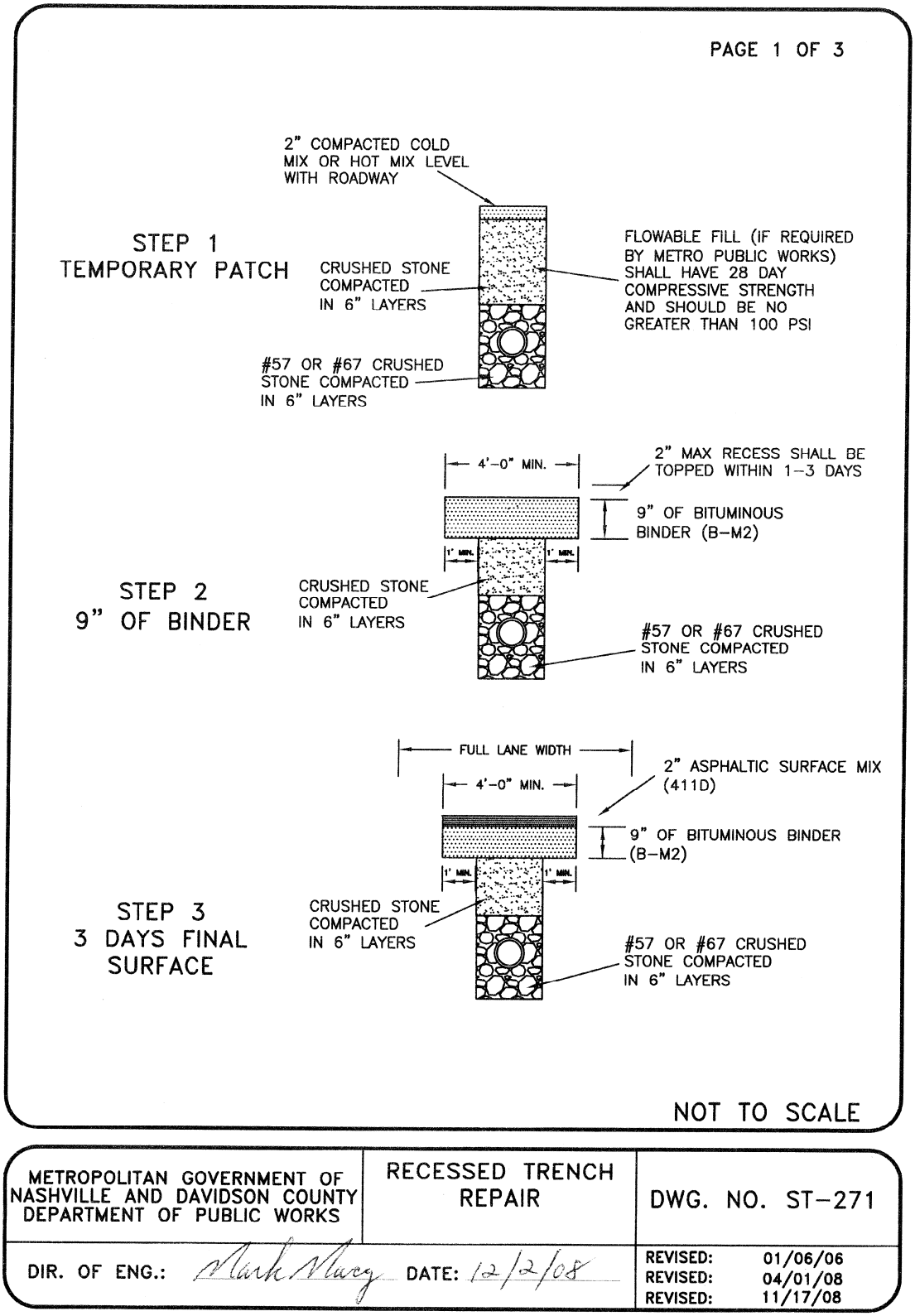



Figure D.4. Details of a recessed trench repair.

GENERAL NOTES

PAGE 2 OF 3

1. PRIOR TO PLACEMENT OF CRUSHED STONE OR FLOWABLE FILL THE DEPARTMENT OF PUBLIC WORKS PERMITS OFFICE WILL BE NOTIFIED AND AN INSPECTION OF THE TRENCH WILL BE MADE BY A REPRESENTATIVE OF THE DEPARTMENT OF PUBLIC WORKS PERMITS OFFICE. AT THE COMPLETION OF THE INSTALLATION OF THE CRUSHED STONE OR FLOWABLE FILL, THE DEPARTMENT OF PUBLIC WORKS PERMITS OFFICE WILL BE NOTIFIED AND AN INSPECTION OF THE BACKFILL WILL BE MADE BY A REPRESENTATIVE OF THE DEPARTMENT OF PUBLIC WORKS. AFTER ACCEPTANCE OF THE BACKFILL BY THE REPRESENTATIVE OF THE DEPARTMENT OF PUBLIC WORKS PERMITS OFFICE, THE ASPHALT PAVEMENT CAN BE APPLIED.

2. INSPECTION PERSONNEL OF THE DEPARTMENT OF PUBLIC WORKS SHALL BE NOTIFIED BY CONTRACTOR/PERMITEE AT LEAST TWO (2) DAYS PRIOR TO REQUEST FOR INSPECTION.

3. THE WORK PERFORMED SHALL BE FREE FROM WORKMANSHIP DEFECTS FOR A PERIOD OF ONE (1) YEAR AFTER THE DATE OF ACCEPTANCE BY THE DEPARTMENT OF PUBLIC WORKS PERMIT OFFICE.

4. EXISTING PAVEMENTS, BASES, CURBS & GUTTERS AND SIDEWALKS SHALL BE CUT AND BROUGHT TO A NEAT LINE BY USE OF AN AIR HAMMER, SAW OR OTHER SUITABLE EQUIPMENT. EXPANSION JOINTS REMOVED SHALL BE REPLACED.

5. THE MINIMUM WIDTH TO BE TRIMMED ON EACH SIDE OF THE TRENCH LINE, AS SEEN IN THE SECTION MAY BE WAIVED OR AMENDED UPON APPROVAL OF THE METRO INSPECTOR, HOWEVER, A MINIMUM WIDTH OF REPLACEMENT SHALL BE 4'–0" TO ALLOW FOR A ROLLER.

6. IF PERMANENT PAVEMENT REPAIRS CANNOT BE MADE WITHIN THREE (3) DAYS, THEN TEMPORARY REPLACEMENT SHALL BE MADE WITH 2" COLD MIX OR HOT BITUMINOUS SEAL COAT OVER COMPACTED CRUSHED STONE. PERMANENT PAVEMENT REPAIR TO BE COMPLETED WITHIN THE TIME PERIOD AS PER METRO CODE 13.20.

7. ALL EXCAVATIONS MADE WITHIN PUBLIC RIGHT–OF–WAY REQUIRE EXCAVATIONS AND STREET CLOSURE PERMITS FROM THE DEPARTMENT OF PUBLIC WORKS PRIOR TO COMMENCING WORK AS PER METRO CODE 13.20.

8. FLOWABLE FILL WILL BE REQUIRED ON ALL ARTERIALS, COLLECTORS AND DOWNTOWN STREETS. FLOWABLE FILL SHALL MEET THE REQUIREMENTS IN TENNESSEE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS SECTION 204, EXCEPT AS MODIFIED BY PUBLIC WORKS TECHNICAL SPECIFICATIONS 02225, LATEST REVISION.

9. IN THE EVENT OF ANY CONFLICT, DISCREPANCY, OR INCONSISTENCY AMONG THE PLANS AND THESE STANDARD DETAILS, THE REQUIREMENTS OF THE STANDARD DETAILS SHALL GOVERN.

10. ALL REPAIRS SHALL INCLUDE FULL LANE WIDTH RESURFACING EXCEPT WHEN UTILIZING INFRARED TECHNOLOGY. SEE INFRARED SPECIFICATIONS ATTACHED. THERE WILL BE A MAXIMUM OF 40 FT LONGITUDINAL REPAIR WHEN USING INFRARED TECHNOLOGY ON AN EXCAVATED PATCH.

11. ALL REPAIRS SHALL UTILIZE A 1–FOOT CUTBACK ON ALL SIDES EXCEPT THE EDGE OF PAVEMENT.

NOT TO SCALE

| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | RECESSED TRENCH REPAIR NOTES | DWG. NO. ST–271a |
|---|---|---|
| DIR. OF ENG.: Mark Macy | DATE: 12/8/08 | REVISED: 07/31/02<br>REVISED: 09/10/04<br>REVISED: 11/17/08 |

Figure D.5. Page 1 of notes pertaining to a recessed trench repair.

PAGE 3 OF 3

GENERAL NOTES CONTINUED:

12. NEW UTILITY CUTS WILL BE MILLED AND PAVED TO ANY EXISTING UTILITY CUT OR DAMAGED PAVEMENT WITHIN 10–FEET. IF EXISTING CUT OR DAMAGED PAVEMENT IS LESS THAN 10–FEET IN LENGTH, THE EXISTING CUT OR DAMAGED PAVEMENT SHALL ALSO BE MILLED AND PAVED.

13. ASPHALT REPAIR ADJACENT TO CURB AND GUTTER ALONG A ROADWAY GREATER THAN 24–INCHES SHALL HAVE FULL LANE WIDTH PAVING.

14. WHEN GRADED STONE (I.E. #57, #67, #78 STONE) IS USED THERE IS GENERALLY NO COMPACTION EQUIPMENT REQUIRED. THE MATERIAL DOES, HOWEVER, NEED TO BE PUT IN THE TRENCH IN APPROXIMATELY 12–INCH LIFTS.

15. GRADED STONE PLACED IN TRENCH SHOULD BE CAPPED WITH 8 TO 12–INCHES OF PUG MIX (MIX IS ESSENTIALLY TYPE A BASE, GRADE D, OR MORE COMMONLY KNOWN AS "CRUSHER RUN"). SEE TDOT STANDARD SPECIFICATION 303.07.

16. TYPE "A" BASE, GRADE "D" CAN BE USED FOR THE ENTIRE BACKFILL AND COMPACTED BY MECHANICAL METHODS IN NO MORE THAN 6–INCH LIFTS AS PROVIDED IN SECTION 204.11 OF TDOT STANDARD SPECIFICATIONS.

17. THE PUG MIX SHOULD BE COMPACTED IN 6–INCH LIFTS WITH A STEEL SHELL ROLLER OR OTHER MECHANICAL VIBRATORY COMPACTION EQUIPMENT. SEE TDOT STANDARD SPECIFICATIONS 303.08 AND 303.09. MATERIAL SHOULD BE ALLOWED TO CURE UNTIL ALL THE MOISTURE IS GONE FROM STONE (USUALLY 24–48 HOURS).

18. THE TRENCH SHOULD THEN HAVE 11–INCHES OF BINDER PLACED LEVEL WITH THE ROADWAY IN A MINIMUM OF TWO (2) LIFTS AND COMPACTED WITH MECHANICAL COMPACTION EQUIPMENT.

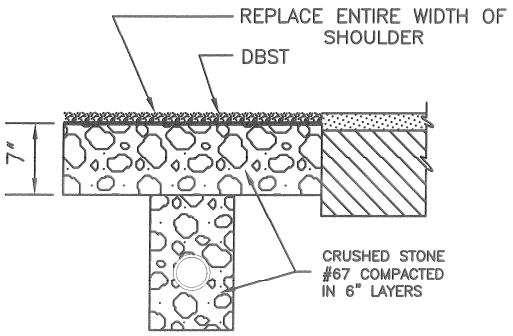
19. ASPHALT SURFACE MATERIAL SHOULD BE PLACED AT 2–INCH THICKNESS AND COMPACTED WITHIN 1–3 DAYS AFTER THE BINDER IS PLACED.

20. INTERSECTION REPAIRS WILL ONLY REQUIRE FULL LANE WIDTH PAVING.

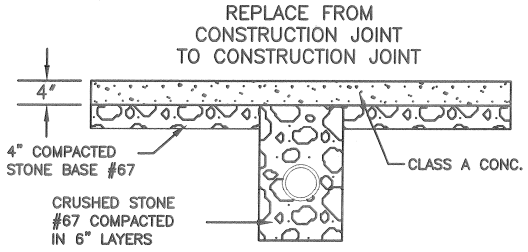
NOT TO SCALE

| | | |
|---|---|---|
| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | RECESSED TRENCH REPAIR NOTES | DWG. NO. ST–271b |
| DIR. OF ENG.: Mark Macy DATE: 12/2/08 | | REVISED: 03/31/06<br>REVISED: 11/17/08<br>REVISED: |

Figure D.6. Page 2 of notes pertaining to a recessed trench repair




SHOULDER REPLACEMENT




SIDEWALK REPLACEMENT

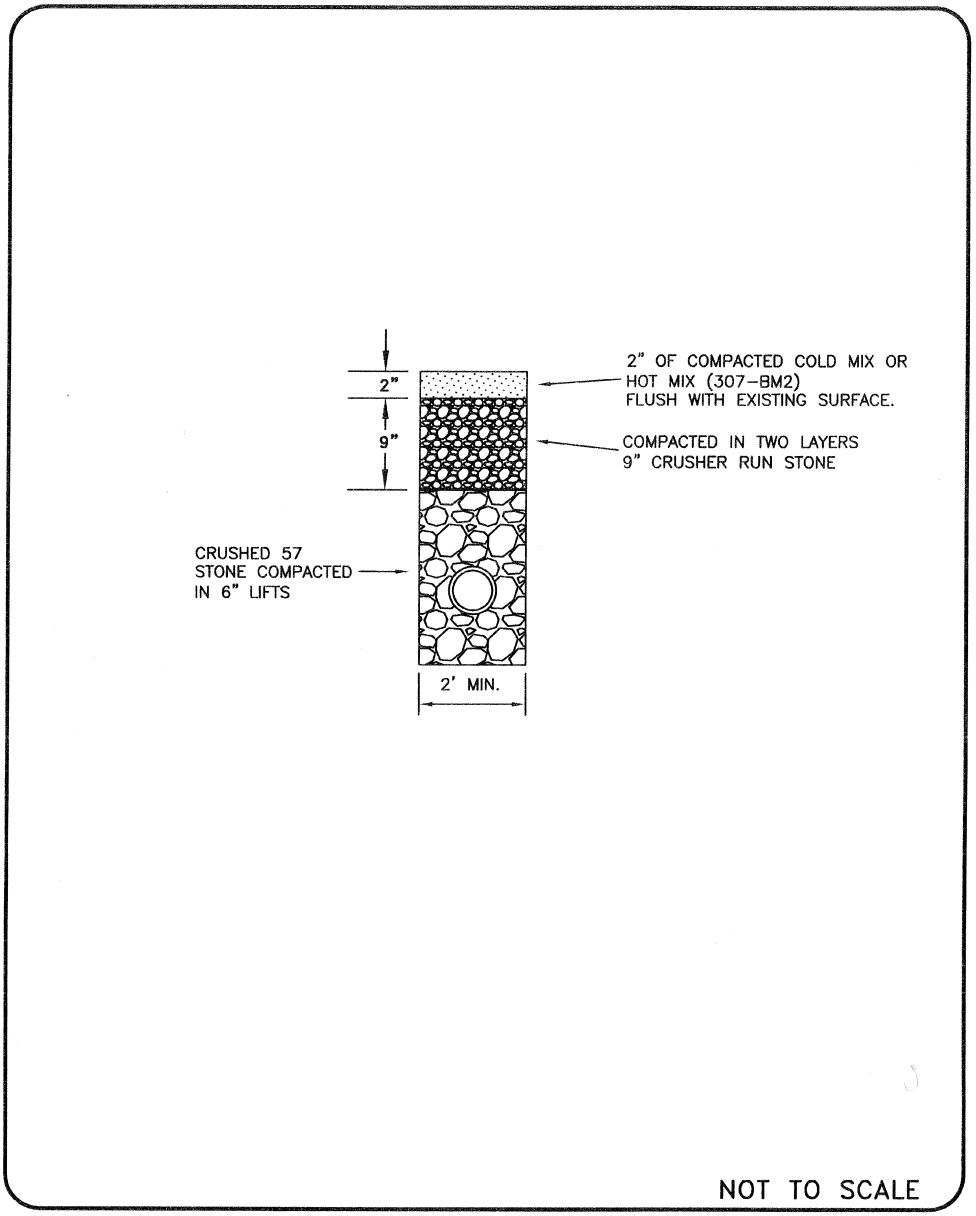
GENERAL NOTES:

1. ALL WORK SHALL BE FIELD CHECKED AND APPROVED BY THE METROPOLITAN PUBLIC WORKS DEPARTMENT PRIOR TO ITS BEGINNING AND AFTER COMPLETION THEREOF.
2. INSPECTION PERSONNEL OF THE DEPARTMENT SHALL BE NOTIFIED AT LEAST TWO (2) DAYS PRIOR TO COMMENCING WORK.
3. THE WORK PERFORMED SHALL BE FREE FROM WORKMANSHIP DEFECTS FOR A PERIOD OF ONE (1) YEAR AFTER COMPLETION.
4. EXISTING PAVEMENTS, BASES, CURBS & GUTTERS AND SIDEWALKS SHALL BE CUT AND BROUGHT TO A NEAT LINE BY USE OF AN AIR HAMMER, SAW OR OTHER SUITABLE EQUIPMENT. EXPANSION JOINTS REMOVED SHALL BE REPLACED.
5. THE MINIMUM WIDTH TO BE TRIMMED ON EACH SIDE OF THE TRENCH LINE, AS SEEN IN THE SECTION MAY BE WAIVED OR AMENDED UPON APPROVAL OF THE METRO INSPECTOR, HOWEVER, A MINIMUM WIDTH OF REPLACEMENT SHALL BE 4'–0" TO ALLOW FOR A ROLLER.
6. IF PERMANENT PAVEMENT REPAIRS CANNOT BE MADE WITHIN THREE (3) DAYS, THEN TEMPORARY REPLACEMENT SHALL BE MADE WITH 2" COLD MIX OR HOT BITUMINOUS SEAL COAT OVER COMPACTED CRUSHED STONE.
7. ALL EXCAVATIONS MADE WITHIN PUBLIC RIGHT–OF–WAY REQUIRE EXCAVATIONS AND STREET CLOSURE PERMITS FROM THE PUBLIC WORKS DEPARTMENT PRIOR TO COMMENCING WORK.
8. IN THE EVENT OF ANY CONFLICT, DISCREPENCY, OR INCONSISTENCY AMONG THE PLANS AND THESE STANDARD DETAILS, THE REQUIREMENTS OF THE STANDARD DETAILS SHALL GOVERN.

NOT TO SCALE

| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | TRENCH REPAIR OUTSIDE ROADWAY | DWG. NO. ST–272 |
|---|---|---|
| DIR. OF ENG.: Mark Macy DATE: 9/10/04 | | REVISED: 12/01/00<br>REVISED: 06/23/04<br>REVISED: 09/10/04 |

Figure D.7. Details for trench repair outside of roadway.




- Figure D.8. Details for a temporary patch

## D.4 UTILITY CUT GUIDELINES

Guidelines for consideration when updating the existing specification are presented in this section. The recommended practices can be easily converted to specifications and incorporated into the appropriate sections of Chapter 13.20 of the Metro Code.

### D.4.1 General Requirements

All contractors and public utility agencies must obtain a ROW Permit for any work performed within the public rights-of-way of Metropolitan Nashville and Davidson County. The storage of materials and equipment within the public rights-of-way also requires a permit.

To preserve the original investment of the street and roadway systems, minimize the disruption and maximize the safety to the traveling public caused by construction, and reduce future maintenance problems, it is the policy of some agencies to require the installation of new utilities across existing streets be done by boring or tunneling. Open cutting of existing streets for the installation of new utilities will be permitted only when it can be proven it is not possible to use boring or tunneling techniques.

Applicants for Right-of-Way Permits must plan for adequate time for review and approval by the MPW and any other involved agencies. Generally, the greater the scope of work, the longer the permit review and approval process will take. Definitions and Abbreviations are found in the Glossary in Appendix C.

Upon obtaining a permit and after making the cut, the applicants are required to repair the streets using a quality approach to preserve the value of the street.

### D.4.2 Quality Requirements

Every street and street repair situation is unique. Design criteria and construction standards cannot address every situation but, in order to maintain some form of consistency, these standards have been developed. In most cases, they provide the minimum acceptable standards for construction or repair. Consequently, when strictly applied, they will provide the minimally acceptable product. Therefore, this criteria has been developed to maintain the same integrity of the street pavement and subsurface condition prior to its being cut for utility installations.

The proposed criteria are guidelines to achieve the goal of "Quality" in street repairs. When used in conjunction with good planning and judgment, the repair methods will maintain the street at an acceptable condition with minimal patching failures.

Quality assurance measures, recommended further in this chapter, should be enforced to ensure the desired quality level.

### D.4.3 Appearance of Utility Cut Repairs

The final appearance of the street after the repairs are made should be acceptable with an engineered appearance. Street repairs that are satisfactory from a functional point of view may produce a negative reaction from the public if they give the appearance of being poorly planned or executed. The public's perception of street repairs is based primarily on shape, size, and orientation--the geometry of a patch. Following are guidelines for the geometry of a quality patch:

- Street repairs should leave a pavement in a condition at least as good as, if not better than, the condition prior to the repairs. In most cases, and particularly in the cases of extensive excavation and repairs, it is desirable to survey the existing pavement condition with a representative of MPW prior to the work. After completion of the work, survey the pavement condition again to verify that the pavement condition has been maintained or improved. In the case of minor repairs, these pavement surveys can be made by visual observation.
- In the case of major projects that involve excessive haul of materials or unusually heavy construction equipment or activity, non-destructive testing of the pavement condition before and after construction may be required.
- Excavations and street repairs, even well constructed street repairs, shorten a pavement's life. Several types of street distress, settlement, alligator cracking, and potholes, often show up around patches. Quality street repairs should attempt to reduce the occurrence of these types of distress.
- Avoid weakening or destroying the existing pavement around an excavation with heavy construction equipment, stockpiling, or delivery of materials, etc. When damage does occur, remove the damaged pavement, extending the limits of the street repair, before replacing the pavement. No stockpiling of backfill or road building materials is permitted on the pavement.

### D.4.4 Utility Cut Repair Details

Figures D.9 through D.11 show the acceptable methods for making utility cut repairs in intersections. Figure D.9 is the case where the utility cut is contained in only one quarter of the intersection; Figure D.10 is the case where the utility cut encompasses more than one quarter but is contained in one half of the intersection. Figure D.11 is for the case where the utility cut encompasses more than one half of the intersection.

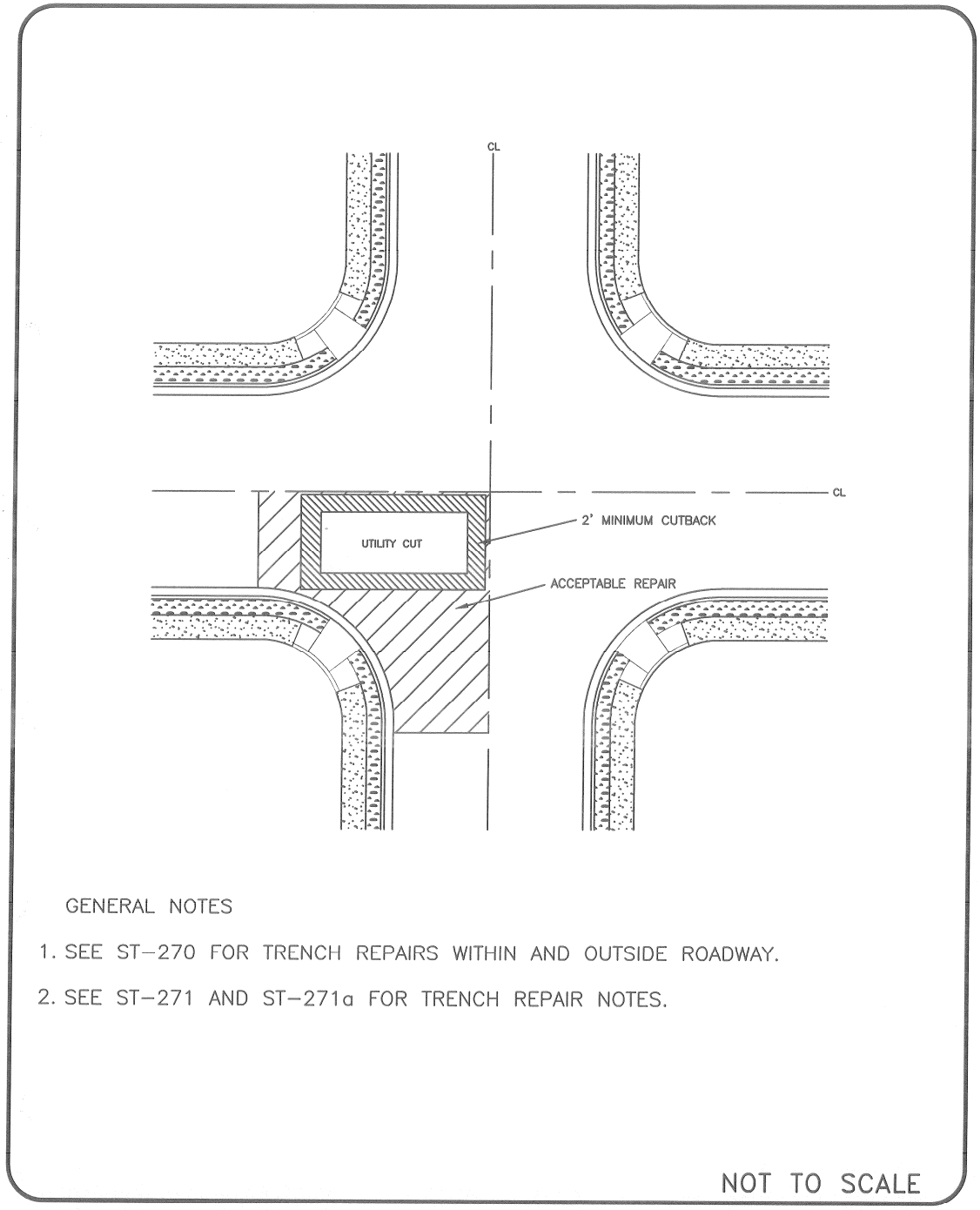



Figure D.9. Utility cut contained in one quarter of intersection.

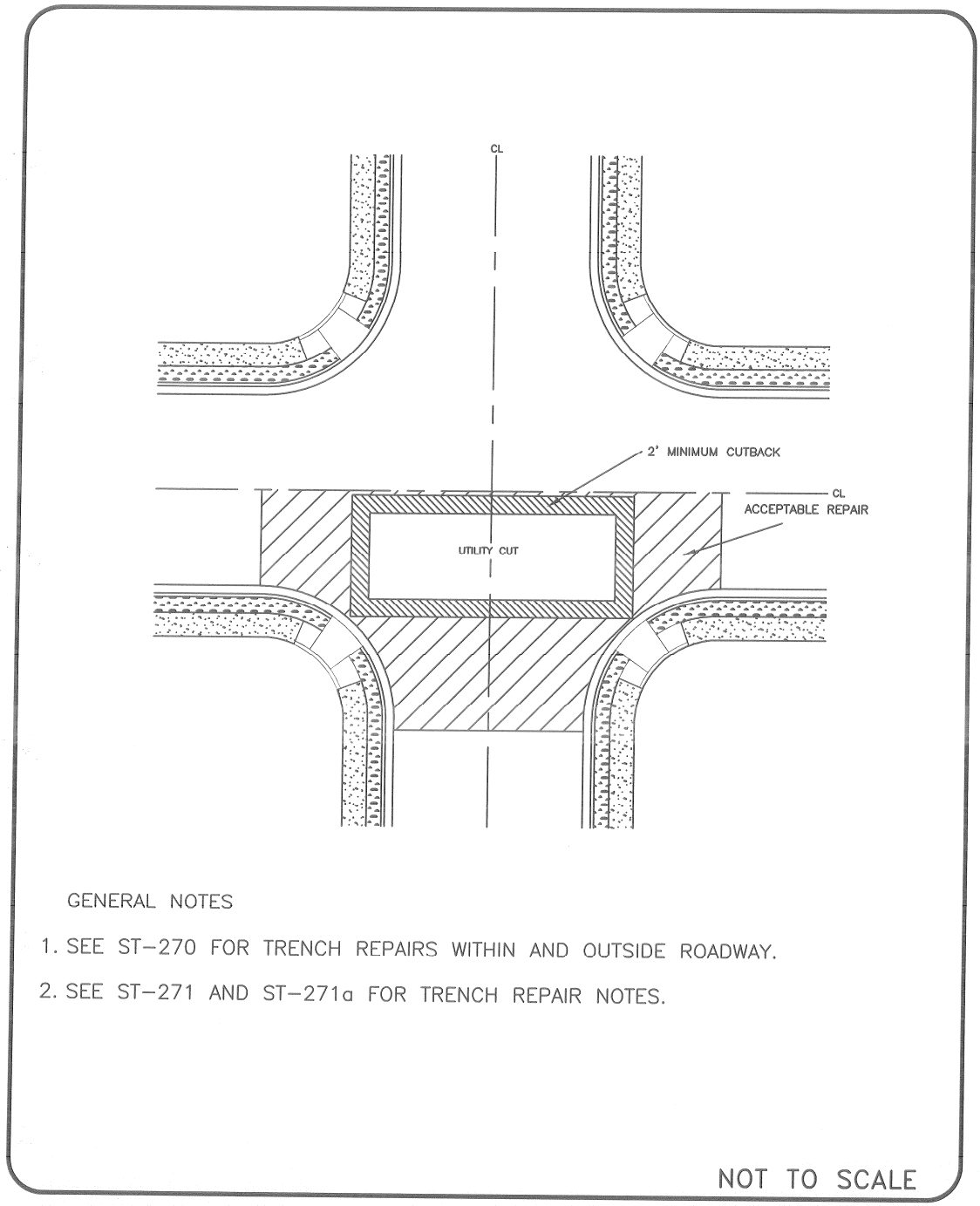



Figure D.10. Utility cut contained in one half of intersection.

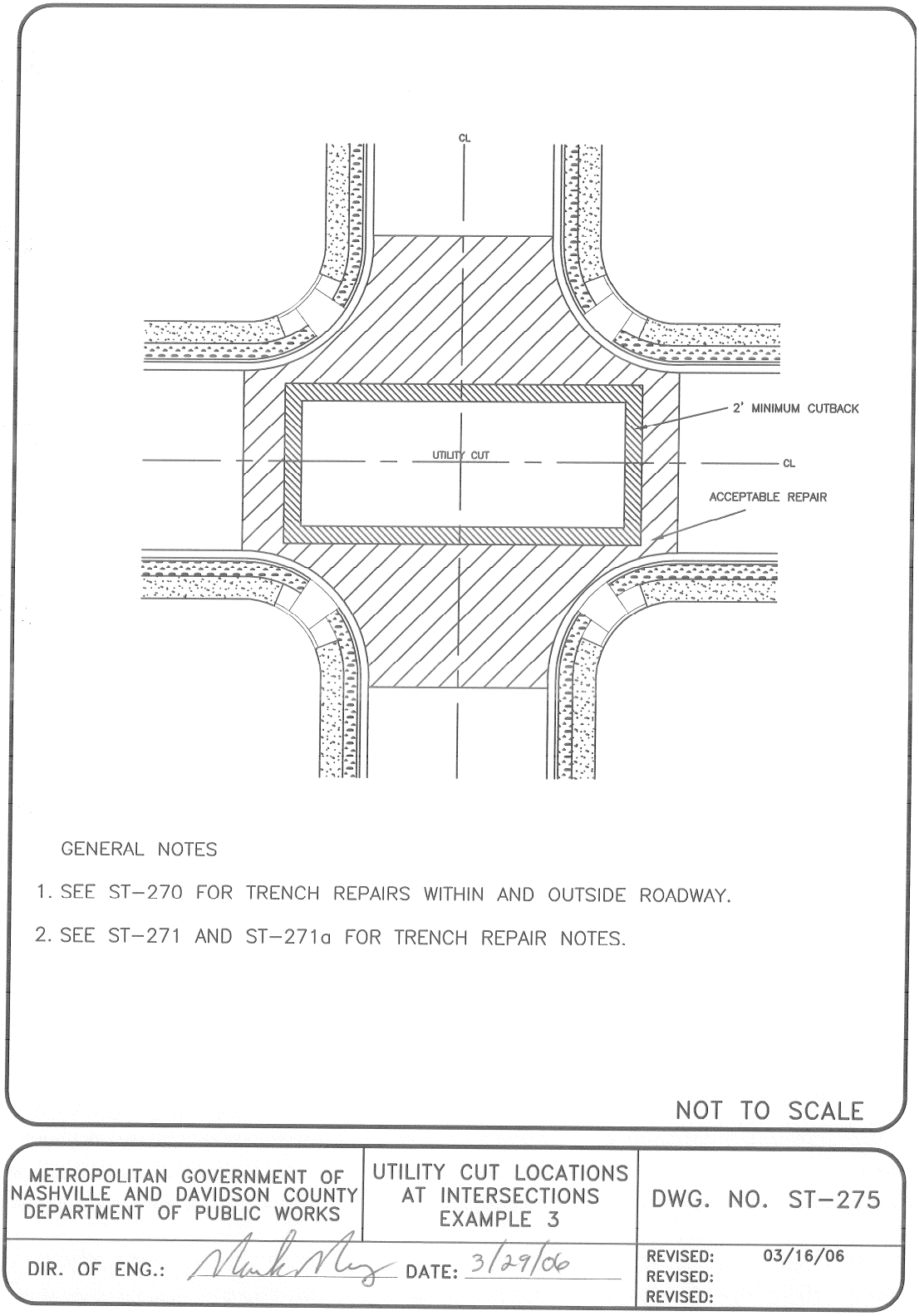



Figure D.11. Utility cut contained encompasses more than one-half of intersection.

Some examples of repair methods that are not acceptable and the corresponding acceptable method are provided in the following Figures D.12 through D.24.

**Example 1**

Existing pavements should be removed to clean, straight lines parallel and perpendicular to the flow of traffic. Do not construct patches with angled sides and irregular shapes. All repairs should be full lane width.

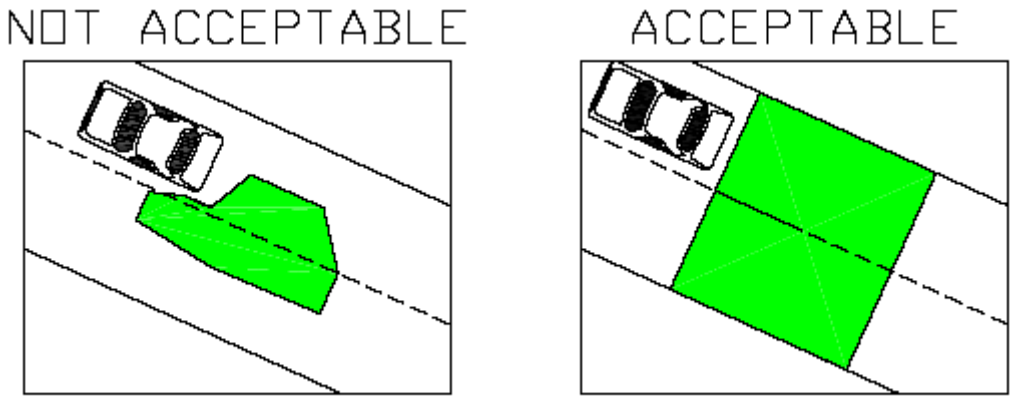



Figure D.12. Example 1: Do not construct patches with angled sides and irregular shapes.

**Example 2**

Avoid patches within existing patches. If this cannot be avoided, make the boundaries of the patches coincide. All repairs should be full lane width.

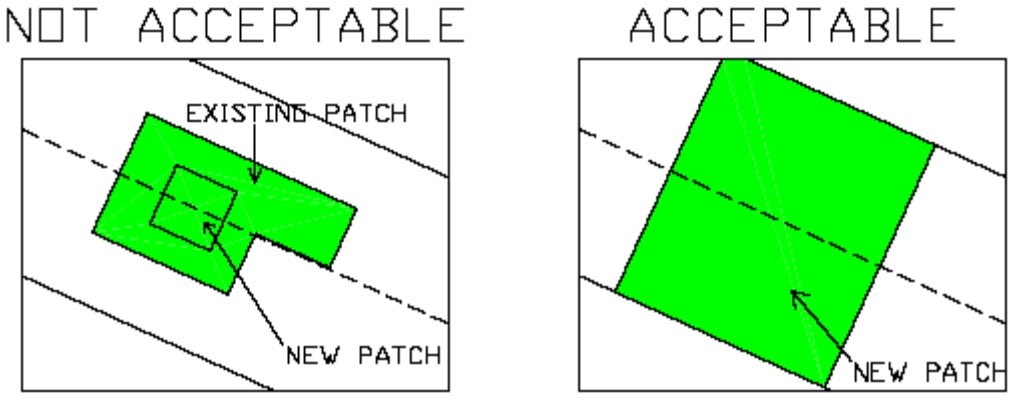



Figure D.13. Example 2: Avoid patches within existing patches.

**Example 3**

Do not leave strips of pavement less than one-half lane in width from the edge of the new patch to the edge of an existing patch or the lip of the gutter.

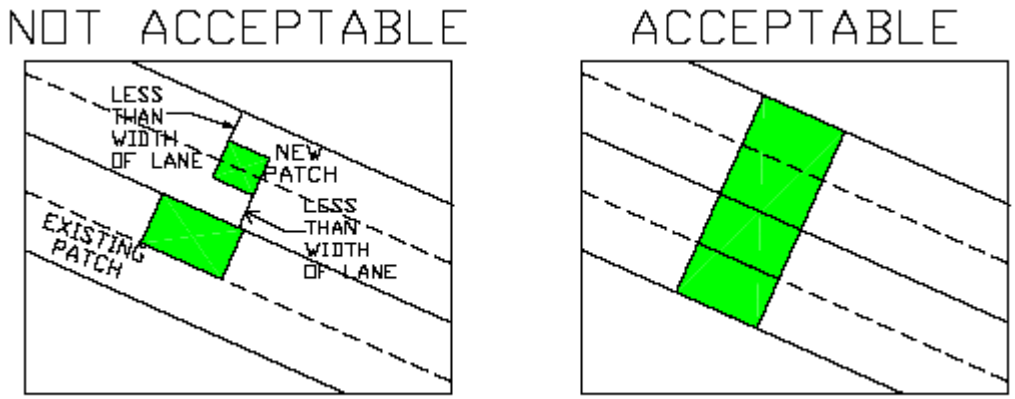



Figure D.14. Example 3: Do not leave strips of pavement less than one-half lane in width.

**Example 4**

In concrete pavements, remove sections to existing joints, or new saw cut joints at mid-slab, that are in good repair. In damaged concrete, the limits of removal should be determined in the field by a representative of MPW.

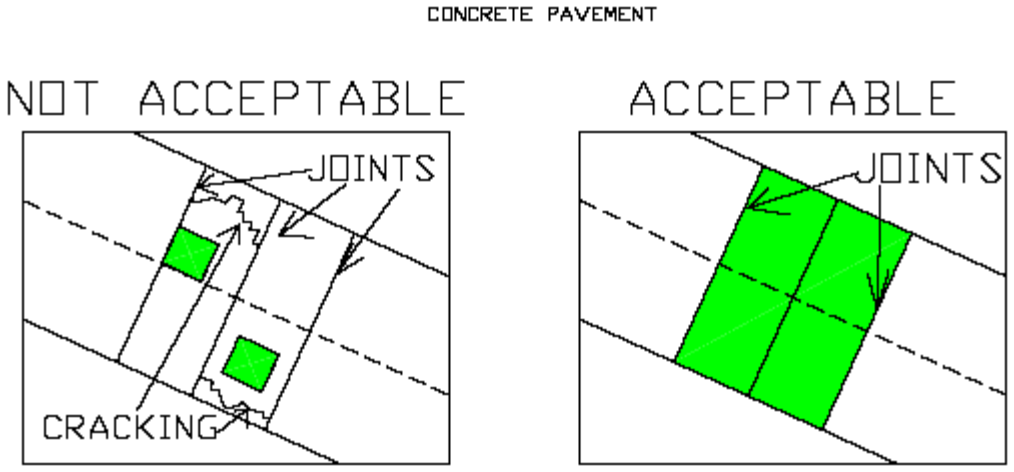



Figure D.15. Example 4: In concrete pavements, remove sections to existing joints.

**Example 5**

Asphalt and concrete pavements should be removed by saw cutting or grinding. Avoid breaking away the edges of the existing pavement or damaging the remaining pavement with heavy construction equipment.

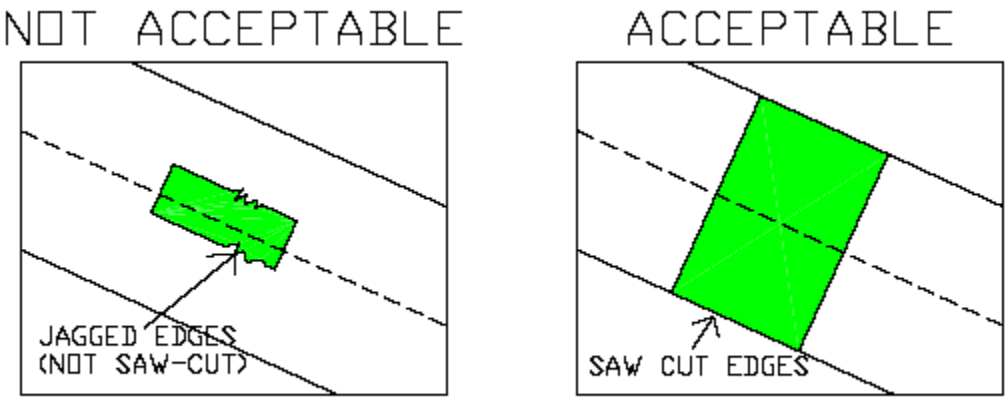



Figure D.16. Example 5: All edges shall be saw cut.

**Example 6**

In the case of a series of patches or patches for service lines off a main trench, repair the pavement over the patches by grinding and overlay when the spacing between the patches is less than 10 feet. In cases where the existing pavement is in poor condition (in the Strategic Paving Plan) and may require overlay within the next few years, this requirement may be modified or waived by the MPW Pavement Manager.

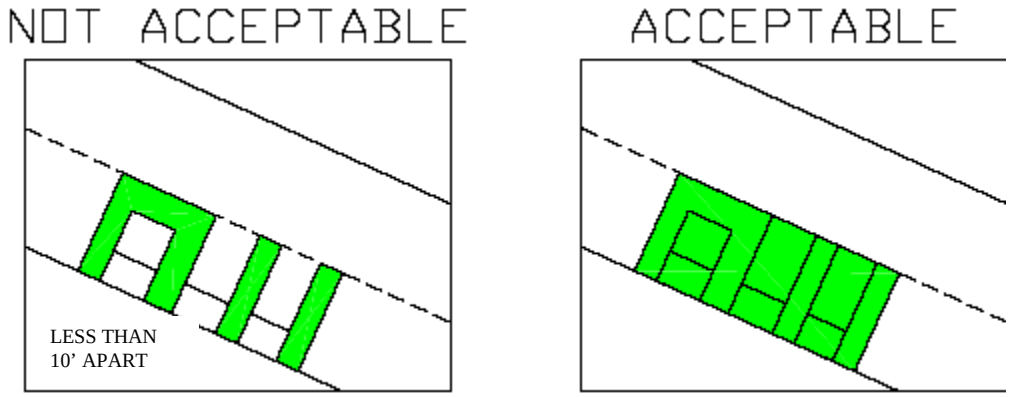



Figure D.17. Example 6: The patched area must include any existing patches within 10 feet.

**Example 7**

Completed street repairs should have rideability at least as good as, if not better than, the pavement prior to the repairs. A driver may be able to see a street repair, but in the case of a quality repair, should not be able to "feel" it in normal driving. A patch should provide a smooth ride with smooth transitions on and off the repair and all joints should be located outside the wheel path. Overlays should be placed by first removing the existing pavement to the desired depth by grinding or milling, and then placing the pavement flush with the adjacent surfaces. Overlays with feathered edges are not acceptable.

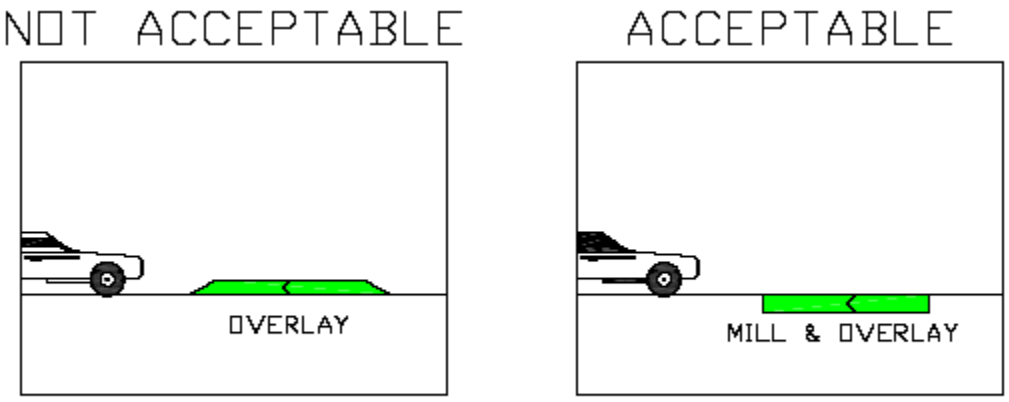



Figure D.18. Example 7: Patches may not decrease rideability.

**Example 8**

Surface tolerances for street repairs should meet the standard for new construction. That is, the finished surface of the street repair should be tested with a ten- (10-) foot straightedge parallel to the centerline or perpendicular across joints. Variations measured from the testing face of the straightedge to the surface of the street repair should not exceed one-quarter- (¼-) inch.

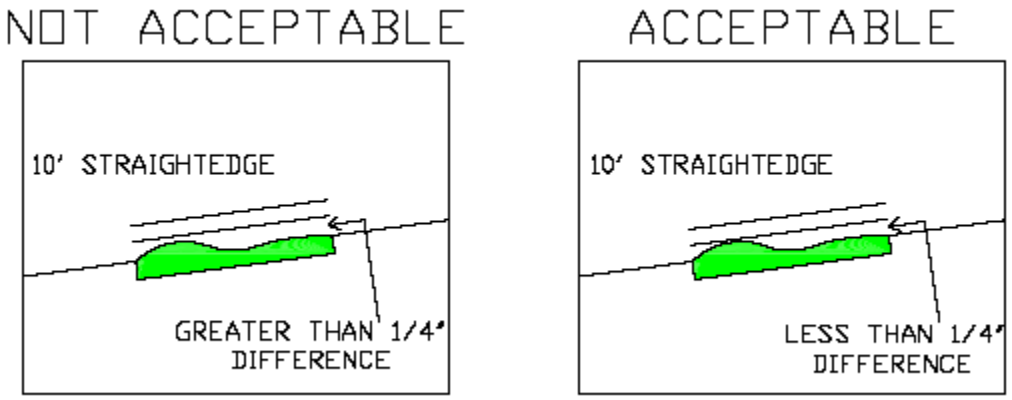



Figure D.19. Example 8: Surface tolerances for street repairs should meet the standard for new construction.

**Example 9**

Transverse patches on arterial and collector streets shall be overlaid across the entire street width for a distance of two- (2-) feet minimum on all sides of the trench using a T-Patch.

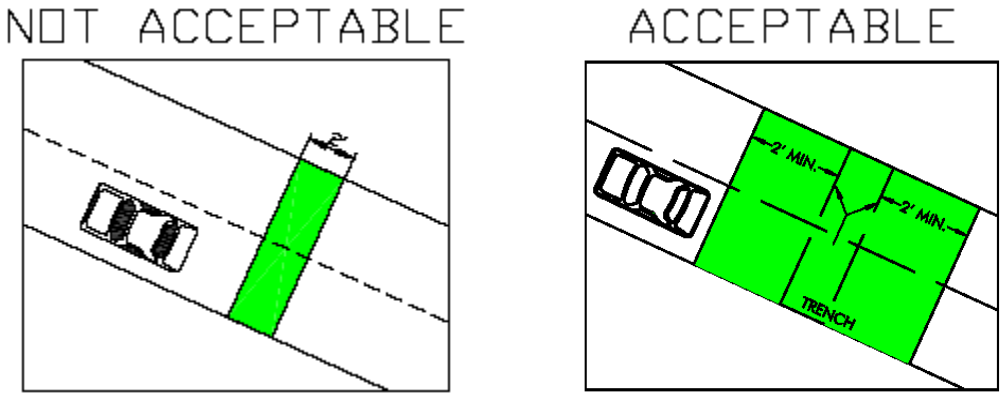



Figure D.20. Example 9: Trenches must be patched using a T-Patch.

**Example 10**

Do not allow the edges of patches to fall in existing wheel paths. The edges of patches parallel to the direction of traffic shall be limited to the boundaries of lanes or to the centerline of travel lanes.

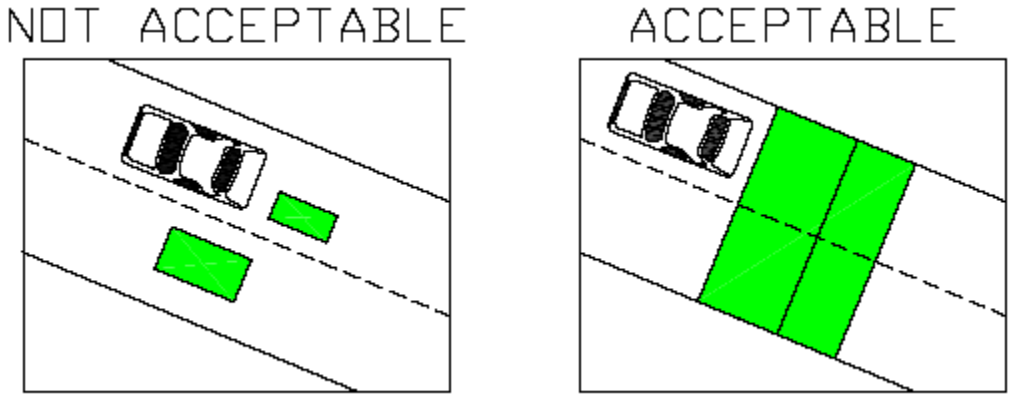



Figure D.21. Example 10: Do not allow the edges of patches to fall in wheel paths.

**Example 11**

Patches should have a smooth longitudinal grade consistent with the existing roadway. Patches should also have a cross slope or cross section consistent with the design of the existing roadway.

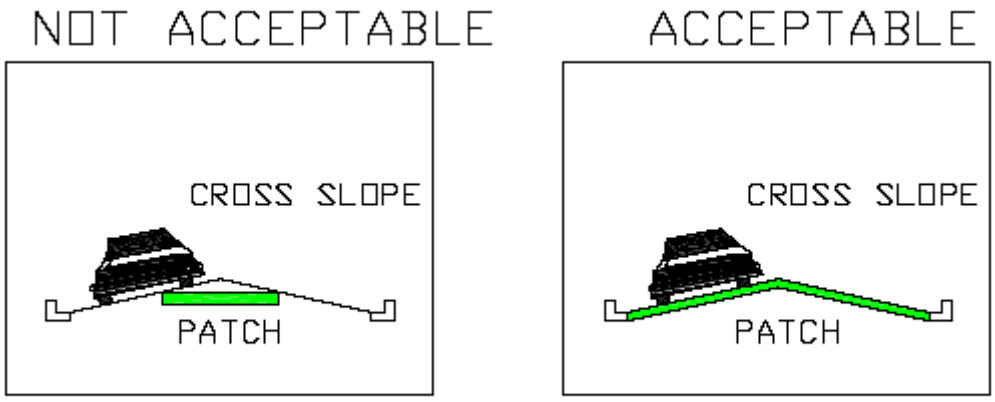



Figure D.22. Example 11. Patch slope and grade must match existing pavement.

**Example 12**

When the proposed excavation falls within 10 feet of a section of pavement damaged during the utility repair, the failed area shall be removed to sound pavement and patched. Scarring, gouging, or other damaged pavement adjacent to a patch shall be removed and the pavement repaired to the satisfaction of the MPW.

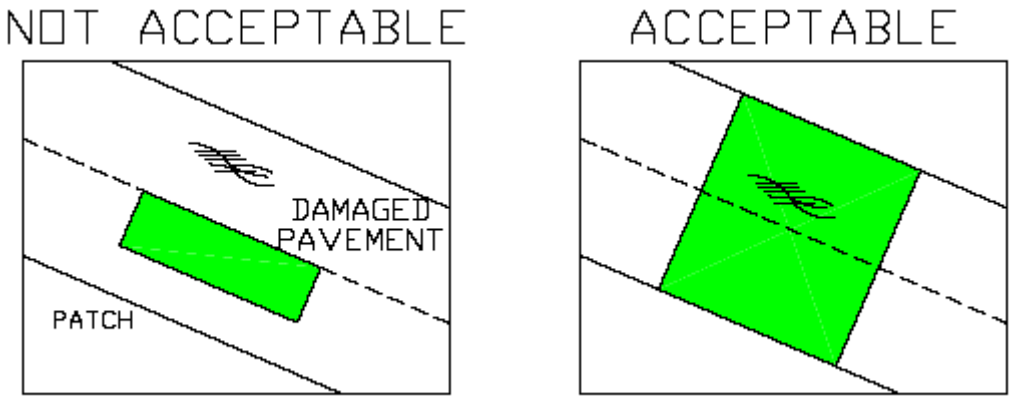



Figure D.23. Example 12: Damaged pavement within 10 feet of a patch must also be patched.

**Example 13**

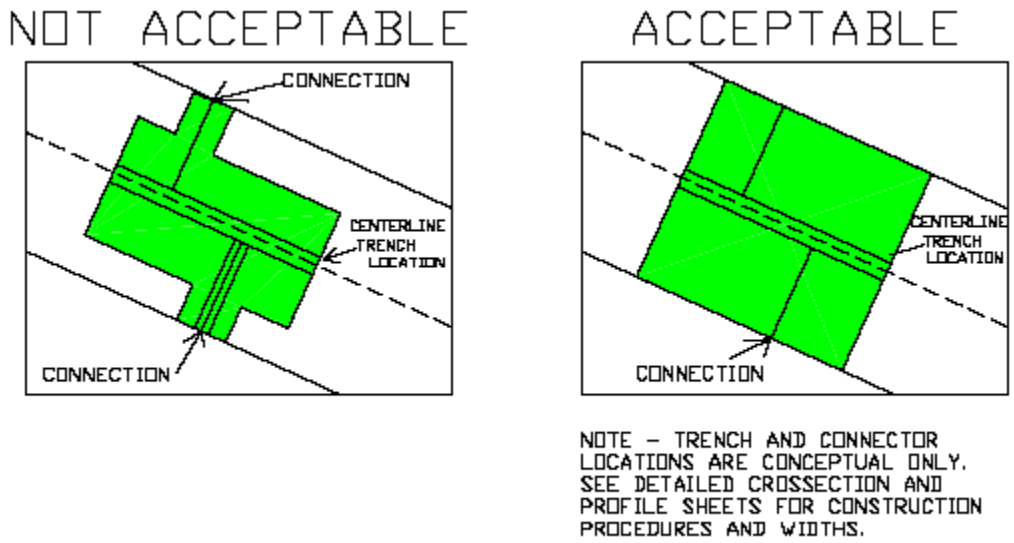



Figure D.24. Example 13: Patches must avoid frequent width changes.

## D.5 TESTING AND INSPECTION

The contractor is required to provide material testing for each phase of the work and at no cost to MPW. The testing firm chosen to perform this work for the Contractor must be qualified and identified on the Permit application.

### D.5.1 Testing Requirements

Density and thickness tests may be required to ensure compaction requirements are met and the appropriate compacted thickness of repair material has been placed. The number of tests required will be as directed by MPW. The costs of any testing, as required, shall be borne by the contractor. If sections with deficient thickness or density are found, the full section for a reasonable distance on each side of the deficiency shall be refused. All such sections shall be removed and reinstalled to these Guidelines.

### D.5.2 Inspection Requirements

All construction work within the public rights-of-way shall be subject to inspection by MPW and certain types of work may have continuous inspection. It shall be the responsibility of the contractor to provide safe access for the inspector to perform the required inspections.

It shall be the responsibility of the person performing the work authorized by the Permit to notify MPW or an authorized representative that such work is ready for inspection. Every request for inspection is to be received at least twenty-four (24) hours before such inspection is desired. Such requests may be in writing or by telephoning or faxing MPW.

MPW may make or require other inspections of any work as deemed necessary to ascertain compliance with the provisions of these guidelines. Any work performed without the required inspections shall be subject to removal and replacement at the contractor's expense, regardless of the quality of the work.

Where large scale projects exceed the ability of the MPW to provide inspection, the contractor or utility company will incur the cost of a private inspection firm. This inspection firm will be mutually agreed upon by the Permit applicant and MPW prior to issuance of the Permit.

## D.6 CONSTRUCTION DETAILS

The conditions described below apply to all work done within the public rights-of-way such as utility line installation or repairs performed by any contractor or utility department, public or private.

### D.6.1 Protection of Existing Improvements

The contractor shall at all times take proper precautions and be responsible for the protection of existing street and alley surfaces, driveway culverts, street intersection culverts or aprons, irrigation systems, mail boxes, driveway approaches, curb, gutter and sidewalks and all other identifiable installations that may be encountered during construction.

The contractor shall, at all times, take proper precautions for the protection of existing utilities, the presence of which are known or can be determined by field locations of the utility companies. The contractor shall contact the local One Call for utility locations a minimum of two (2) working days prior to the proposed start of work.

Existing improvements to adjacent property such as landscaping, fencing, utility services, driveway surfaces, etc., which are not to be removed shall be protected from injury or damage resulting from the contractor's operations.

The contractor shall at all times take proper precautions for the protection of property pins/corners and survey control monuments encountered during construction. Any damaged or disturbed survey markers shall be replaced by a registered land surveyor at the contractor's expense.

The repair of any damaged improvements as described above shall be the responsibility of the permit holder.

The contractor shall make adequate provisions to assure that traffic and adjacent property owners experience a minimum of inconvenience

All work shall be done in an expedient manner. Repairs shall be made as rapidly as is consistent with high-quality workmanship and materials. Use of fast-setting concrete and similar techniques is encouraged whenever possible without sacrificing the quality of repair. For repairs 12 feet or less in length, completion of the work including replacement of pavement and cleanup shall normally be accomplished within two (2) weeks after the repair work or activity involving the cut is done. For repairs greater than 12 feet in length, the final surface shall not be placed for a minimum of 42 days from the placement of the binder material. Extension of time for completion, including winter and other weather delays, shall be with the written approval of MPW. If the repairs are not completed in the allotted time, MPW has the right to repair the street at the contractor's expense.

### D.6.2 Temporary Surfaces Required

When the final surface is not immediately installed, it shall be necessary to place a temporary asphalt surface on any street cut opening. The temporary surface installation and

maintenance shall be the responsibility of the Permittee until the permanent surface is completed and accepted. It shall be either a hot mix or cold mix asphalt paving material. Temporary surfaces shall be compacted, rolled smooth, and sealed to prevent degradation of the repair and existing structures during the temporary period. Permanent patching shall occur within two (2) weeks except as outlined by the MPW in the Permit.

### D.6.3 Pavement Patches

All permanent pavement patches and repairs shall be made with "in kind" materials. For example, concrete patches in concrete surfaces, full depth asphalt patches with full depth asphalt, concrete pavement with asphalt overlay patches will be expected in permanent "overlaid" concrete streets, etc. In no case is there to be an asphalt patch in concrete streets or concrete patch in asphalt streets. Any repair not meeting these requirements will be removed and replaced by the contractor at no expense to MPW.

### D.6.4 Removal and Replacement of Unsatisfactory Work

Removal and replacement of unsatisfactory work shall be completed within fifteen (15) days of written notification of the deficiency unless deemed an emergency requiring immediate action. In the event the replacement work has not been completed, MPW will take action upon the contractor's bond to cover all related costs.

### D.6.5 Warranty for Satisfactory Work

The utility company will be held responsible for a 24-month period for any defects in the patch that may result in a PCI of 85 or less as defined by ASTM D6433 as modified for this study.

## D.7 REMOVALS

### D.7.1 Paved Streets

Bituminous pavement removal areas shall be saw cut to clean, straight lines that are perpendicular or parallel to the flow of traffic.

In existing pavement, all excavations within 36 inches of the edge of the asphalt shall require removal and replacement from the edge of asphalt to the excavation edge.

Concrete pavement, driveways, streets, and alleys shall be removed to neatly sawed edges cut to full depth.

### D.7.2 Gravel Streets

When trenches are excavated in streets or alleys that have only a gravel surface, the contractor shall replace such surfacing on a satisfactory compacted backfill with gravel conforming to MPW specification aggregate base course. Gravel replacement shall be one (1) inch greater in depth to that which originally existed, but not less than four (4) inches. The surface shall conform to the original street grade. Where the completed surface settles, additional gravel base shall be placed and compacted by the Contractor within fourteen (14) days after being notified by MPW, to restore the roadbed surface to finished grade.

Some streets may have been treated with a special surface treatment to control dust and/or bind the aggregates together. In these cases, the Contractor is responsible for installing the gravel surface in the same manner as what was existing. Such surface treatments shall be of

the same chemical composition as what existed prior to the excavation work. MPW shall note on the permit the surface treatment that will be required.

### D.7.3 Concrete Curb, Gutter and Sidewalk

Concrete shall be removed to neatly sawed edges to full depth for sidewalks and curb and gutter and shall be saw-cut in straight lines either parallel to the curb or perpendicular to the alignment of the sidewalk or curb. Any removal shall be done to the nearest joint. Replaced sections may require doweling connections if required by MPW.

## D.8 BACKFILL

### D.8.1 Flowable-Fill

Flowable-fill may be used as utility trench backfill for all trenches unless otherwise specified by MPW. This requirement applies to all pavement and gravel locations. Compaction will be as specified by MPW.

The recommended mix for flowable-fill is shown below. Concrete backfill will not be allowed within the public right-of-way. Flash-fill may be used if approved by MPW. Refer to the appropriate MPW specification.

Table D.1. Recommended flowable-fill mix design.

| INGREDIENTS | POUNDS/CUBIC YARD |
|---|---|
| Cement | 42 (0.47 sack) |
| Water | 235 (39 gallons or as needed) |
| Coarse Aggregate (Size No. 57) | 1700 |
| Sand (ASTM C-33) | 1845 |

The maximum desired 28-day strength is 60 psi. The above combination of material, or an equivalent, may be used to obtain the desired "flowable-fill".

Flowable-fill or flash-fill shall be prohibited as a temporary or permanent street surface. Trenches shall initially be backfilled to the level of the original surface. After the flowable-fill has cured, the top surface of the flowable-fill shall be removed and the temporary or permanent surface shall be placed.

Bridging and cutback requirements as described in these standards may still be required if the street failures indicate a clear need.

Repair of failed trenches will be the responsibility of the party requiring the trench.

### D.8.2 Conventional Backfill (Other Than Flowable-Fill)

When "non flowable-fill" backfill material has been pre-approved by MPW, backfill in existing or proposed streets, curbs, gutters, sidewalks and alleys is divided into three (3) categories: initial, intermediate and final lifts as defined below:

- The INITIAL LIFT, comprised of washed, clean gravel material**,** consists of the section from the bottom of the excavation to a point six to twelve (6 - 12) inches above the top of the installation. Placement and compaction of the initial layer shall be as specified by the utility company to protect their installation.

- The INTERMEDIATE LIFT, generally comprised of #67 crushed stone, consists of the section above the initial layer to a point within six (6) inches of the ground level or the bottom of the pavement section, whichever is greater.
- The FINAL LIFT includes both road base and asphalt surfacing. Road base material shall meet MPW specification for aggregate base course or as specified by MPW. Maximum dry density of all soil types used will be determined in accordance with AASHTO T 99 or AASHTO T 180. These densities will be determined prior to placement of backfill.

## D.9 RESTORATION

### D.9.1 Bore Holes - Vertical and Horizontal

For openings less than or equal to 6 inches in diameter, bore holes shall be filled with patching material (cold mix is not acceptable) to prevent entry of moisture. Patching material used shall be in all cases compatible with the existing surface. Subgrade shall be replaced with flowable fill to provide necessary support to the surface. The sealing of bore holes is the responsibility of the contractor or persons making the bore. For openings greater than 6 inches in diameter, the limits of repair shall be identified in the permit. The completed job shall be flush with the surrounding pavement and have no indentations, pockets, or recesses that may trap and hold water.

### D.9.2 Subgrade

The subgrade for the pavement structure shall be graded to conform to the cross sections and profile required by the construction plans. Prior to the placement of aggregate base course or sub-course, the subgrade should be properly prepared. The subgrade should be scarified to a minimum depth of six (6) inches, moisture adjusted as necessary, and recompacted.

Prior to approval to place the base or sub-base course, all utility main and service trenches shall be compacted. The density requirement also applies to all utility trenches within the public rights-of-way from a point four (4) feet beyond the edge of asphalt and descending at 1:1 outward.

### D.9.3 Asphalt Surfacing

Any damage, even superficial, to the existing asphalt surface in the vicinity of the work shall be repaired at the expense of the Contractor, including but not limited to gouges, scrapes, outrigger marks, backhoe bucket marks, etc. A slurry seal type covering will be considered the minimum repair. Patching may be required, at the discretion of MPW.

The depth of asphalt patches in asphalt streets shall typically be the depth of the existing asphalt surface plus 1 inch or as specified by the Engineer.

The asphalt patch area for street excavations that fall within the wheel path of the vehicular travel lane shall be increased in size to the center of the lane or adjacent lane. In no circumstance will the edge of a patch area be allowed to fall within the wheel path.

In streets that are less than five (5) years old or have a PCI greater than 85, the MPW reserves the right to deny any street excavation or require repairs that are over and above these specifications.

### D.9.4 Concrete Surfacing and Patching

The concrete pavement shall be replaced with 4,000 psi concrete to match the finish and thickness of the existing pavement, but not less than eight (8) inches thick. All concrete construction shall be protected from vehicular traffic, including contractor vehicles, until the concrete has achieved eighty (80) percent of its ultimate strength. Concrete shall be coated and sealed with a uniform application of membrane curing compound applied in accordance with manufacturer's recommendations.

The use of quick-curing concrete (3000 psi strength within 48 hours) shall be used on all arterial and collector streets when repair areas are less than 500 square feet or when temperatures are below 40° F. Quick-curing concrete repairs may be opened to traffic within two (2) days or when the concrete has achieved eighty (80) percent of its ultimate strength.

Where existing cracks or damage is adjacent to the area being repaired, the repair area shall include the cracked or damaged concrete. Pavement repairs shall include all areas of damage, including leak test holes, pot holes, equipment, and/or material scarring of the exiting surface.

When repairing concrete, removal perimeter shall be saw-cut, and replacement concrete shall be doweled into the old concrete as directed by MPW.

## D.10 IMPLEMENTATION

The community investment in streets and roads is a major component of the community assets. As custodians of these facilities, MPW has the obligation and responsibility to protect the public interest.

Presented herein have been concepts and examples that can easily be incorporated into MPW specifications. These examples provide a cost-effective approach to achieve quality repairs of utility cuts that will satisfy the public motorists and achieve levels of service meeting the expectations of MPW.

# Appendix 10.A – Utility Coordination Notification

Metro Nashville
PUBLIC WORKS

# MEMORANDUM

720 South 5th Street ▪ Nashville, TN ▪37206-3805
Office: (615) 862-8760 ▪ Fax: (615) 862-5568

| | |
|---|---|
| **Date:** | **Month DD, YYYY** |
| **To:** | Chief Engineer, Metro Public Works<br>Capital Improvement Division Manager, Metro Public Works<br>List other Public Works Staff as needed, Metro Public Works<br>Mike Morris, Metro Water Services<br>Stormwater Division, Metro Water Services **(FINAL CONSTRUCTION PLANS ONLY)**<br>Environmental Compliance Division, Metro Water Services<br>Nashville Electric service<br>Piedmont Gas Company<br>AT&T<br>Comcast<br>Google Fiber<br>Madison Suburban Utility District<br>ADA Compliance Division<br>Other Utility Companies |
| **From:** | Metro Project Manager |
| **Attachments:** | Preliminary/R.O.W. Plans and Plan Review Sheet |
| **Subject:** | **Preliminary Plans & Utility Review Meeting for Project Name**,<br>Metro Project Number, CIB Number |

This will confirm that arrangements have been made regarding a Preliminary Plans and Utility Review Meeting for the subject project. Persons desiring to attend this review will meet **via WebEx** [or at the Metro Public Works Director's Conference Room, **720 S. 5th Street]** on [DAY], [MONTH DD, YYYY] at [TIME] a.m./p.m. using the following link: _____.

The plans and plan review sheets are enclosed and are also available at the following link: _____.

Please review the plans, fill out the plan review sheets, and be prepared to discuss your review comments at the meeting. For those who cannot attend the meeting, please send the comments to via email to [Project Manager's email address], or by mail at the address listed above.

If you have any questions, please contact [Name], Project Manager, at (615) 862-XXXX.

Enclosure

cc: Project Folder

Appendix 13.A – Development Services Pre-Construction Agreement

# Department of Public Works - Metropolitan Government of Nashville

- All roadway construction is required to comply with the approved construction plans and the specifications and standards of the Metro Department of Public Works, available online at http://www.nashville.gov/pw/index.htm.

- All inspections require 24 hours advance notice given to the Public Works inspector. Call Bobby Akin 862-8761 (office) 456-3724 (cell) or Tim O'Brien 862-8774 (office) 456-4095 (cell).

- Prior to proof rolling of any street subgrade the contractor is required to verify the subgrade is at the elevations and cross-sections (crown) as described on the approved constructions plans with centerline and curbline grade stakes. Said grades shall be within 1 inch from the approved plans. In any case the full depth of stone, binder, and wearing courses will be required as shown on the approved plans.

- Prior to the placement of any stone on a street subgrade, the prepared subgrade shall be proof- rolled in the presence of a Public Works inspector, with a fully loaded tandem truck to confirm proper subgrade compaction. Any areas deemed unsuitable (pumping) by the inspector shall be excavated and backfilled with suitable fill material. After the unsuitable areas have been backfilled and compacted, the areas shall be proof-rolled again.

- All base stone material is to meet the gradation shown on the construction plans and be delivered to the site from an approved commercial quarry operation. No on site crushed stone is to be allowed for base stone material.
- The placement of base stone, binder course, and wearing surface, shall not commence until the Public Works inspector has been notified and gives the contractor approval to proceed.

- After placement of the first four inch lift of stone, the contractor must call for inspection, and verify the proper thickness of stone has been placed prior to installation of curbs. To verify thickness, contractor shall excavate stone to subgrade with a pick at 50 foot intervals as directed by the metro inspector.

- Prior to curb and gutter installation, the grassed strip and sidewalk areas are to be at the proper graded elevations.

- Curbs must be protected to prevent chipping and damage. Cosmetic repairs are not allowed; damaged curbs must be completely removed and replaced in minimum 3 feet sections. An inspection is required prior to final paving and all damaged curb and gutter repaired prior to final paving.

- Sidewalks are to be installed on any lot prior to use and occupancy of a house.

- There are to be only two (2) bond reductions prior to completion and acceptance.

- Final paving (top coat) can be done after 75% house build out. All building permits are to be put on hold after 90% build out until the streets receive final paving.

**I understand these requirements and certify my agreement to comply with the approved construction plans and all standards and specifications of the Department of Public Works.**

**Subdivision Name: _____**

| | |
|---|---|
| _____ | _____ |
| **Contractor Representative Sign and Print Name** | **Owner Representative Sign and Print Name** |
| _____ | _____ |
| **Address** | **Address** |
| _____ | _____ |
| **Cell Phone Office Phone** | **Cell Phone Office Phone** |
| _____ | _____ |
| **E-mail** | **E-mail** |

**Date:** _____ **Date:** _____

**Note: Public Works will not sign off on the subdivision final grading permit until this document is signed and returned to the Public Works Department.**

# Appendix 13.B – Metro Nashville Curb Ramp and Sidewalk Construction Inspection Standard Procedures

# CURB RAMP AND SIDEWALK CONSTRUCTION INSPECTION STANDARD PROCEDURES

FOR

# METRO NASHVILLE PUBLIC WORKS DEPARTMENT

*MARCH 21, 2007*

*REVISED: OCTOBER 21, 2016*

# METRO NASHVILLE DEPARTMENT OF PUBLIC WORKS
# CURB RAMP AND SIDEWALK INSPECTION PROCEDURES

## TABLE OF CONTENTS

SECTION PAGE

# SECTION 1. INTRODUCTION/BACKGROUND

## 1.1 Americans with Disabilities Act of 1990 (ADA)

The ADA, signed into law July 26, 1990, is a federal antidiscrimination law designed to remove barriers which prevent qualified individuals with disabilities from enjoying the same rights as the non-disabled.

The ADA is divided into 3 sections, or Titles. Title I deals with Equal Employment for Individuals with Disabilities, Title III deals with Nondiscrimination on the Basis of Disability by Public Accommodations and Commercial Facilities. The portion that is of most interest to State and Local Government (such as Metro Nashville) is *Title II – Nondiscrimination on the Basis of Disability in State and Local Government Services.* Title II became effective/enforceable, on January 26, 1992.

## 1.2 How ADA Applies to Curb Ramps and Sidewalk Appurtenances

The United States Access Board has published Accessibility Guidelines (ADAAG) that provides technical guidelines for accommodating the disabled. The ADAAG provides geometric specification for, among other things, paths-of-travel and ramps. While it is worthwhile for a person inspecting sidewalks and ramps to be knowledgeable of the relevant aspects of the ADAAG, Metro's construction standards for sidewalks and ramps have been designed with the use of the ADAAG guidelines and in accordance with agreements made between the ADA office and Metro such that an inspector may only be concerned that facilities are constructed to those standards.

## SECTION 2. METRO'S SIDEWALK AND RAMP CONSTRUCTION STANDARDS

The Metro Nashville Public Works Department, in coordination with the Metro Nashville ADA Compliance Division, has developed ADA-compliant standard construction details for all sidewalk appurtenances. The following Standards apply to sidewalks and related appurtenances of sidewalks (such as curb and driveway ramps):

| Detail No. | Detail Description |
|---|---|
| ST-209 | Standard Expansion Joint for Concrete Sidewalk |
| ST-210 | Standard Concrete Sidewalk |
| ST-211 | Obstruction in Sidewalk |
| ST-215 | Standard Curb Ramp Notes |
| ST-320 | New Construction Curb Ramp |
| ST-321 | Alteration Const. Curb Ramp w/ Sidewalk Less Than 9 feet |
| ST-322 | New Construction Residential Driveway Ramp |
| ST-323 | Alteration Const. Residential Driveway Ramp w/ Sidewalk Less Than 9 ft |
| ST-324 | New Construction Commercial Driveway Ramp |
| ST-325 | Alteration Const. Commercial Driveway Ramp w/ Sidewalk Less Than 9 ft |
| ST-326 | Geometric Layout at Curb Returns with Radius 25 feet or Less |
| ST-327 | Geometric Layout at Curb Returns with Radius Greater Than 25 feet |
| ST-328 | Geometric Layout at Curb Notes |
| ST-329 | Detectable Warnings at Curb Returns with Radius 25 feet or Less |
| ST-330 | Detectable Warnings at Curb Returns with Radius Greater than 25 feet |

It is the inspector's responsibility to know and understand the standards construction details in effect for the feature being inspected. In addition, because standard details are updated from time-to-time, the inspector must be aware of any changes that occur to the details and the effective date of the updated detail. The current Metro Public Works construction details can be viewed and downloaded from the Engineering Division's Specifications and Details web page at: http://www.nashville.gov/public-works/developer-services/engineering-details-and-specifications.aspx

The current standards details in effect as of October 21, 2016 are presented In Appendix B.

# SECTION 3. EQUIPMENT – USE, CALIBRATION AND CARE

## 3.1 Equipment Required

To perform sidewalk and curb ramp inspections, the inspector should have the following tools to perform the measurements required:

1. A Steel or Fiberglass measuring tape capable of measuring at least 15 linear feet. The tape must be graduated in tenths of a foot.



2. A measuring wheel, graduated in feet/tenth of a foot

3. A clinometer/level

4. A digital camera or smartphone/tablet


5. A safety vest compliant with ANSI Class II requirements and at minimum, two traffic cones

## 3.2 Equipment Calibration

Because measurements for the inspections must be precise and accurate, it is important to confirm that all equipment is working properly and is calibrated at least daily to ensure the equipment is providing true and correct measurements.

### *3.2.1 Calibrating/verifying Accuracy of the Measuring Wheel*

Because most measuring wheels do not require any calibration, none is required. However, the measuring wheel can read incorrectly if the counter is damaged or worn or if other issues exist with the measuring wheel mechanism. It is important to inspect the measuring wheel daily for worn or damaged parts. In addition, the measuring wheel should be used to measure a "baseline" or a distance of sidewalk of known length to verify that the measuring wheel is performing properly.

### *3.2.2 Calibrating the Clinometer (SmartTool)*

The M-D SmartTool electronic clinometer/level has a built in calibration routine that should be executed daily or at any time the level experiences vibration, a drop or a significant temperature change.

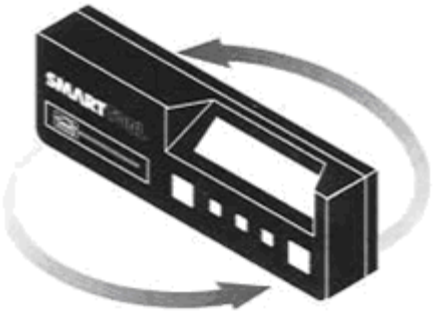
The calibration procedure for a Macklenburg-Duncan SmartTool Clinometer is as follows:

1. Place the SmartTool on a *flat surface* (does not have to be completely level)

2. Wait 10 seconds

3. **Push and hold** the ***Calibrate*** button for 2 seconds. "CAL1" should appear on the display as shown:

4. **Rotate** SmartTool end-to-end and **wait 10 seconds**



5. Push the ***Calibrate*** button again. "CAL2" shall appear *briefly* on the display.

6. Calibration is now **complete** for the SmartTool for leveling.

Important Note:

Before any measurements are taken with the SmartTool, it is imperative to verify the level is set to percent grade (%). To do so, verify that the % symbol shows in the display of the tool. If **%** is not displayed, press the **°%IN/FT** button until the % symbol is displayed as shown below:


## 3.3 Proper Equipment Use

Accurate measurements can only be accomplished if the equipment is properly used. It is important for the inspector to be familiar with the tools required and use them according to the manufacturer's instructions. Measurements must be made with the understanding that the measurements must be able to be duplicated by another inspector at a later time for Quality Assurance purposes. The following are common errors that occur when taking inspection measurements:

1. The level tool must not span an area leaving a void underneath the bottom between each end. In addition, the level must not be able to be "rocked" to where a various number of measurements could be read. The level must be used against a flat surface or to accommodate a rolling slope, point support "feet" must be utilized on the level tool as shown here.

2. All measurements should be performed parallel (*running slope)* and perpendicular (*cross-slope*) to the direction of travel. Measurements not parallel or perpendicular will yield different and incorrect/unintended results.

### 3.4 Job Site Safety

Safety of the inspector must be the primary concern of any field work. The Job Site Safety policies of your organization should be followed for all work. The following key details should be followed for any inspections:

1. The inspector must don his or her safety vest prior to starting any work.

2. Cones must be placed between the inspector work area and any path of vehicular traffic. A sample setup for a curb ramp inspection is show below.

3. Equipment must be kept to the side of the sidewalk travelway. Equipment in the path-of-travel for pedestrians may easily become a tripping hazard for them

4. When in doubt of safety or any injury, do not perform or continue an inspection and notify your supervisor of safety concerns at once.

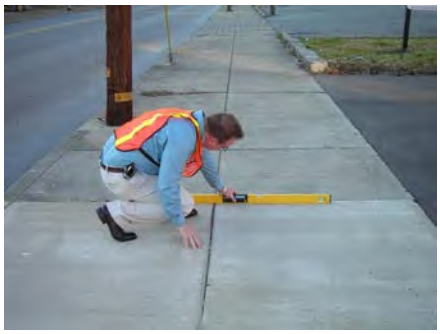
Traffic Cone Placement Example

# SECTION 4. PERFORMING INSPECTION/SURVEY

## 4.1 Sidewalk Inspections

Sidewalk inspections address the inspection of the length of sidewalk from the curb ramp to the next ramp or terminus of the pedestrian route. The following must be collected for sidewalk inspections:

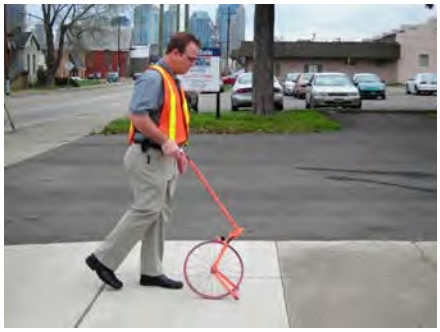
1. Cross-slope of the sidewalk – perpendicular to the direction of travel



2. Running slope of the sidewalk – along the centerline of the sidewalk in the direction of travel

3. Width of the sidewalk

4. Length of the sidewalk “wheeled” carefully



5. Obstruction inventory/assessment
   Obstructions (i.e., utility poles, guy wires, fire hydrants, mailboxes, etc.) should be inventoried and measurements documented to show horizontal and vertical clearances at the obstruction.

## 4.2 Curb Ramp Inspections

Curb ramp inspection and measurements are very detailed. Many distance and slope readings must be taken to complete a ramp inspection. The following are required:

### 4.2.1 Landing Measurements

Collect four (4) slope readings on the landing area of the curb ramp. Two (2) slope readings must be taken in each direction, one (1) at the top edge edge, and one (1) at the opposite edge:

Reading 1: Front of Landing

Reading 2: Top of Landing

The next 2 readings shall be performed in the opposite direction:

Reading 3: Left Side Landing

Reading 4: Right Side Landing

If a reading is greater than 2% then an average reading shall be recorded on the audit report. The report shall indicate that the reading is an average reading by writing “avg” after the reading (i.e., 2.1% avg).

If there is no defined landing—readings shall be performed at the geometric center of the ramp in the travel way. Lack of a defined landing shall be noted on the inspection report.

All slope readings shall indicate the direction of fall (highest elevation to lowest elevation).

Once slope readings have been performed, the dimensions of the landing (length and width) shall be measured.

### *4.2.2 Measurements of Ramp from the gutter line to landing*

Two readings shall to be collected, in the direction of travel, from gutter line to landing. Length and width of the ramp shall also be collected.

Street-to-landing Measurement #1

Street-to-landing Measurement #2

### *4.2.3 Measurements on Sidewalk Approach Ramps*

If ramps are to the right or the left of the landing, a running slope and length and width shall be collected on each approach ramp.

Approach Ramp Measurement (right)

Approach Ramp Measurement (left)

Special Note:

The lip of the ramp curb ramp (where the road surface meets the street-to-landing ramp) should be checked and be less than ¼" vertically. In addition, if there are any utilities, signs, poles, or any other obstructions in the ramp, they shall be noted.

### *4.2.4 Curb Ramp Pictures*

Picture(s) shall be taken at each curb ramp location as required to show all construction at each curb ramp location.

Left View

Front View

Right View

## 4.3 Statements of Technical Infeasibility

In instances where ramps or sidewalk construction fails to meet ADA compliance, and where it would be Technically Infeasible to make the sidewalk feature compliant, a statement to such effect that documents why the construction could not be completed in complete compliance with ADAAG and the standard details of the Public Works Department must be completed. ADAAG (4.6.1j) contains a provision relating to "technical infeasibility", applicable only in alterations. This exception does not apply to new construction. A public agency is exempt from meeting the ADA standards in the rare instance where physical terrain or site conditions restrict constructing or altering the facility to the ADA standard.

The form is rather straight forward, but full documentation, drawings, pictures, etc. must be compiled to fully support the infeasibility. Cost should not be a consideration when considering if a project is technically infeasible.

A sample Technical Infeasibility form is shown in Appendix A.

## SECTION 5. DATA MANAGEMENT PROCEDURES

### *5.1 File Formats*

Although intermediate file formats can be used, all final photos and report files shall be ultimately stored in Adobe Portable Document Format (PDF).

Each curb ramp inspection shall have the curb ramp inspection form as well as 3 photos of the ramp (front, left side oblique, right side oblique) within the PDF. If pre-construction pictures/inspection reports are obtained, they should be stored in a separate PDF and named in accordance with section 5.2 to avoid confusion.

Scanning of curb ramp inspection forms shall be in gray-scale. No color scans shall be accepted. However, photos shall be stored in full color. Image compression shall be set to provide high-quality photos and reports as the first priority, yet file sizes shall be minimized as much as possible.

See appendix C for a sample PDF Curb Ramp document.

### *5.2 File Naming Conventions*

File names shall be as follows.

<u>For curb ramps at intersections:</u>

[RampID]_AF_[MajorCrossStreet]&[MinorCrossStreet].pdf
e.g. 10569_AF_3rdAveSouth&AshSt.pdf

<u>For curb ramps at mid block:</u>

[RampID]_AF_[OnStreet]_MB_[FirstCrossStreet]&[SecondCrossStreet].pdf
e.g. 10569_AF_3rdAveSouth_MB_AshSt&2ndAveSouth.pdf

<u>For curb ramps in front of an address and not at an intersection or mid block:</u>

[RampID]_AF_AD_[HouseNumer]_[OnStreet].pdf
e.g. 10569_AF_AD_806_3rdAveSouth.pdf

 Special Note:

For reports and images of ramps prior to replacement/construction, the text “AF” shall be substituted with “BF” in all instances.

# APPENDIX A

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## BLANK INSPECTION FORMS FOR SIDEWALK AND CURB RAMPS

# CURB RAMP AUDIT REPORT

*DEPARTMENT OF PUBLIC WORKS – ENGINEERING DIVISION*
*720 SOUTH 5TH STREET, NASHVILLE, TENNESSEE 37210*

**PROJECT TYPE:** ☐ Sidewalk ☐ TDOT ☐ Utility ☐ Metro Paving ☐ Com/Res Development

**RAMP ID:**_____ **CONTRACTOR:** _____

**STREET NAME/QUADRANT/CORNER:** _____

**SIDE OF STREET:** ☐ North ☐ South ☐ East ☐ West

**NEAREST CROSS STREET:** _____

**MATERIAL:** ☐ Concrete ☐ Other _____ (***Explain in comments***)

**RAMP STANDARD:** ☐ ST-320 ☐ ST-321

**CONFORMS TO STANDARD:** ☐ Yes ☐ No ***(If no, explain in comments)***
☐ Technically Infeasible ☐ Maximum extent feasible (***Explain in comments)***

**FLUSH MOUNT LIP AT CURB:** ☐ Less than 1/4 inch ☐ Greater than 1/4 inch ☐ Beveled

**OBSTRUCTONS:** ☐ None ☐ Pole ☐ Sign ☐ Fire plug ☐ Signal box ☐ Other_____
(If clearance less than 36" explain on reverse side)

**UTILITY BOX IN RAMP:** ☐ None ☐ Flush ☐ Greater than ½ in. (***Explain in comments***)

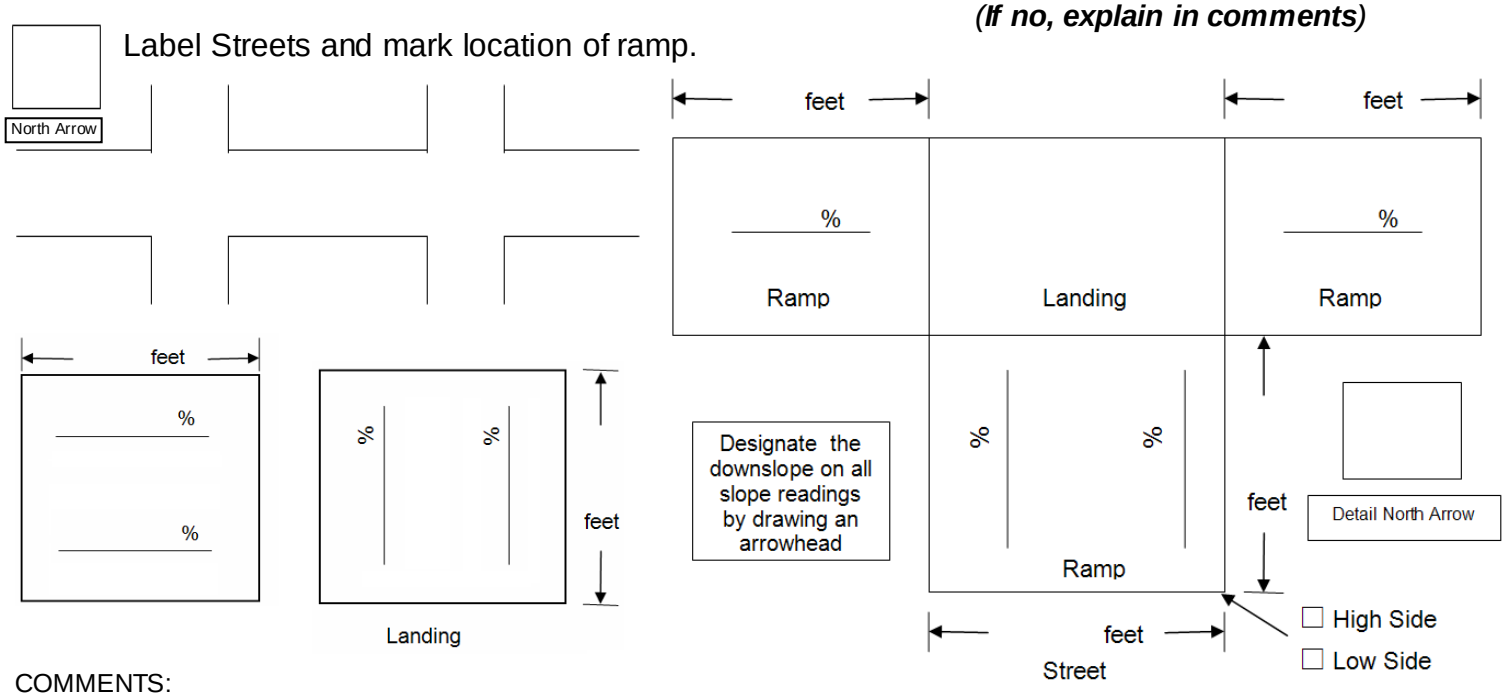
**DETECTABLE WARNINGS WIDTH OF RAMP X 24" & ALIGNED WITH DIR OF TRAVEL:** ☐ Yes ☐ No

**NOTE:** Add a comment to all aspects of curb ramp that are in non-conformance with Metro Standards.

**INSPECTION DATE:** _____ **INSPECTOR:** _____

**RE-INSPECTION DATE:** _____ **CONFORMS TO STANDARD:** ☐ Yes ☐ No
***(If no, explain in comments)***

Label Streets and mark location of ramp.




COMMENTS:

_____

_____

# SIDEWALK AUDIT REPORT

*DEPARTMENT OF PUBLIC WORKS – ENGINEERING DIVISION*
*720 S. FIFTH ST NASH. TN. 37206*

**PROJECT TYPE:** ☐ Sidewalk ☐ TDOT ☐ Utility ☐ Metro Paving ☐ Com/Residential Development

**SIDEWALK ID:** _____ **CONTRACTOR:**_____

**STREET NAME:** _____

**SIDE OF STREET:** ☐ North ☐ South ☐ East ☐ West

**NEAREST CROSS STREET:** _____

**MATERIAL:** ☐ Concrete ☐ Asphalt ☐ Brick ☐ Other _____

**SIDEWALK STANDARD:** ☐ ST-210 ☐ ST-211 ☐ Other _____

**CONFORMS TO STANDARD:** ☐ Yes ☐ No *(If no explain on reverse side)*

☐ Technically Infeasible ☐ Maximum extent feasible (***explain on reverse side***)

**WIDTH:** _____ **LENGTH:** _____

**CROSS SLOPE:** (front to back) ☐ 2% or less ☐ 2% - 3% ☐ 3% or greater

**RUNNING SLOPE OF SIDEWALK GENERALLY MATCHES GUTTER SLOPE?** ☐ Yes ☐ No

**OBSTRUCTIONS:** ☐ None ☐ Pole ☐ Sign ☐ Fire Plug ☐ Signal Box ☐ Other _____
(If clearance less than 36" explain on reverse side)

**UTILITY BOX IN RAMP:** ☐ None ☐ Flush ☐ Greater than ½ in. (Explain on reverse side)

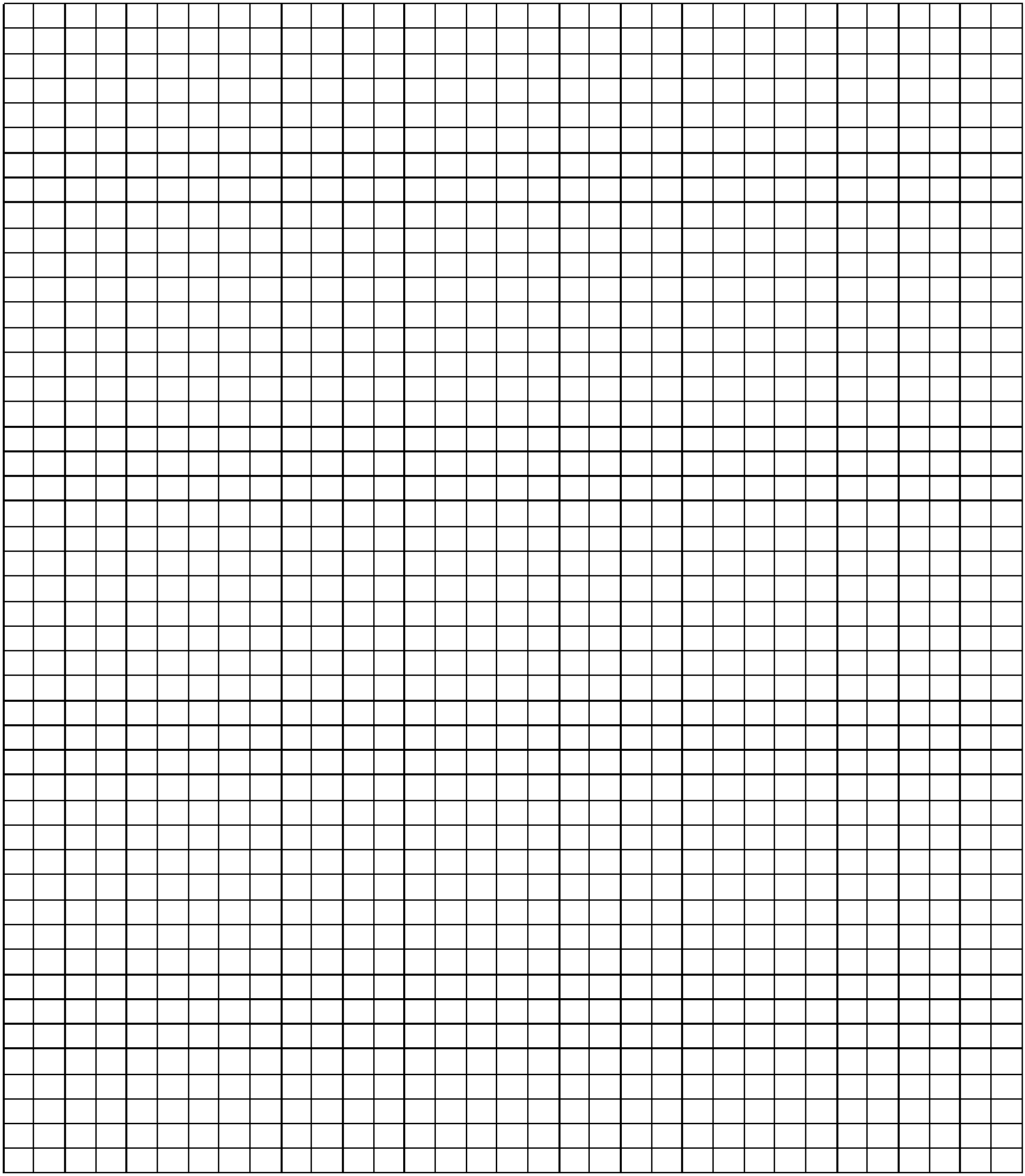
**INSPECTION DATE:** _____ **INSPECTOR:** _____

Label Streets and mark location of sidewalk.

North Arrow

*(Add additional information in accordance with the legend on reverse side of page.)*

Rev. 03/20/2007



**METROPOLITAN GOVERNMENT OF**
**NASHVILLE AND DAVIDSON COUNTY**

**Department of Public Works**
**Division of Engineering**
**720 South Fifth Street, Nashville, Tennessee 37206**
**615-862-8760**

# STATEMENT OF TECHNICAL INFEASIBILITY

In accordance with Metro Public Works Policy, this form is being submitted to document that construction could not be complete in compliance with the standard details of the Department as it is technically infeasible.

FORM MUST BE COMPLETED IN FULL — PLEASE PRINT OR TYPE

**Project Name:** **Project #:**

**Project Location:**

**If at intersection, which corner is the variance necessary? (circle only one)** ○ NW ○ NE ○ SW ○ SE

**What type of work is being performed?**

○ New Construction ○ Repair/Maintenance/Upgrade

**Has bidding or award of contract occurred?** ☐ YES ☐ NO

**IF YES, PLEASE COMPLETE THE FOLLOWING:**

**Contractor Name:** _____

**Contractor Contact Name/Numbers:** _____

**Office:** _____ **Cell:** _____

**Project No.** _____ **Purchase Order No.** _____

**If the construction taking place at or near a qualified historical building/facility, identify the historical designation and indicate the date of designation. If not, please indicate "not applicable" on the lines below.**

**State the Standard Drawing of the specifications for which technical infeasibility is being claimed. Separate applications must be submitted for each standard or specification to be considered.**

| Standard Drawing | Location and Description of Nonconforming Condition |
|---|---|
| | |

Rev. 04/01/04

**State *IN DETAIL* the reason why compliance with the standard or specification is impractical. Include the cost necessary to achieve compliance and any scaled drawings, photos or other documentation that would assist in our determination. Use additional sheets if necessary.**

**To the best of your knowledge, has a complaint ever been filed on the current site relative to accessibility?**

○ NO ○ YES If yes, when? _____

**PLEASE NOTE: The Department shall decide your application based on information submitted. You should include ALL relevant information with your application. Drawings and photographs may be extremely beneficial.**

Date: _____

**Technical Infeasibility Requested by:**

Name

Company/Firm of Inspector

Address

City, State, ZIP

Signature Telephone

Date: _____

**Technical Infeasibility Approved by:**

Name

Company/Firm of Construction Manager/Project Manager

Address

City, State, ZIP

Signature Telephone

# APPENDIX B

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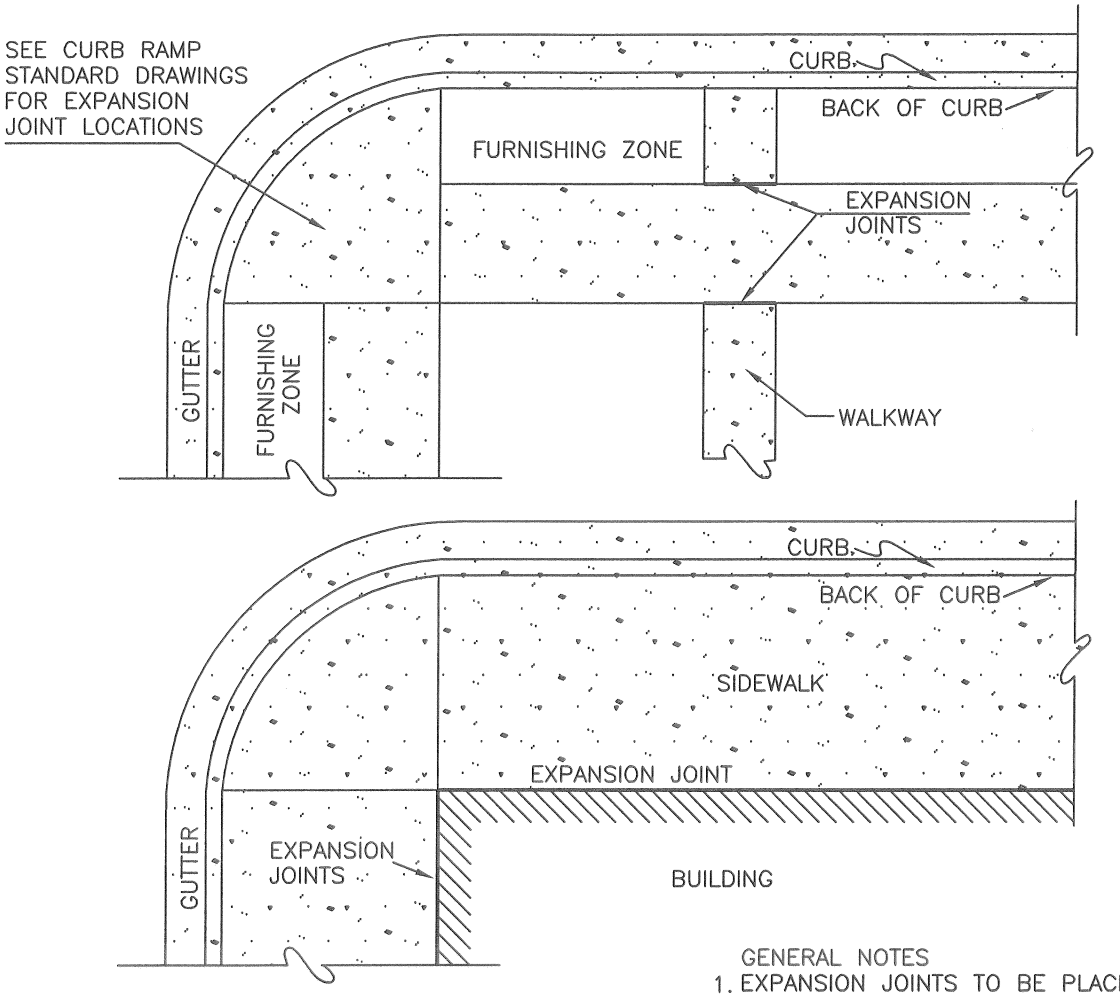
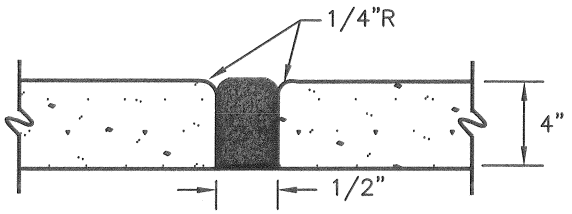
## METRO PUBLIC WORKS
## STANDARD CONSTRUCTION DETAIL DRAWINGS




GENERAL NOTES

1. EXPANSION JOINTS TO BE PLACED AS SHOWN ON THIS DRAWING OR AS DIRECTED BY THE ENGINEER, AT CURB RETURNS, WHERE BUILDINGS ARE ADJACENT TO SIDEWALKS, AND AT WALKWAYS.
2. COST OF ALL EXPANSION JOINTS TO BE INCLUDED IN UNIT BID PRICE FOR SIDEWALKS.
3. ONE–HALF INCH EXPANSION JOINTS TO BE USED IN ALL LOCATIONS.
4. THIS METRO STANDARD DRAWING IS FOR THE EXPANSION JOINTS IN SIDEWALKS. SEE OTHER METRO STANDARD DRAWINGS FOR CURB RAMP PLACEMENT, SIDEWALK DETAILS, OBSTRUCTIONS, ETC.
5. THE EXPANSION JOINT MATERIAL SHALL BE RECYCLED MATERIAL 1/2" THICK AS MANUFACTURED BY J.D. RUSSELL COMPANY, 1–800–888–6872, WWW.JDRUSSELL COMPANY.COM, OR APPROVED EQUAL.

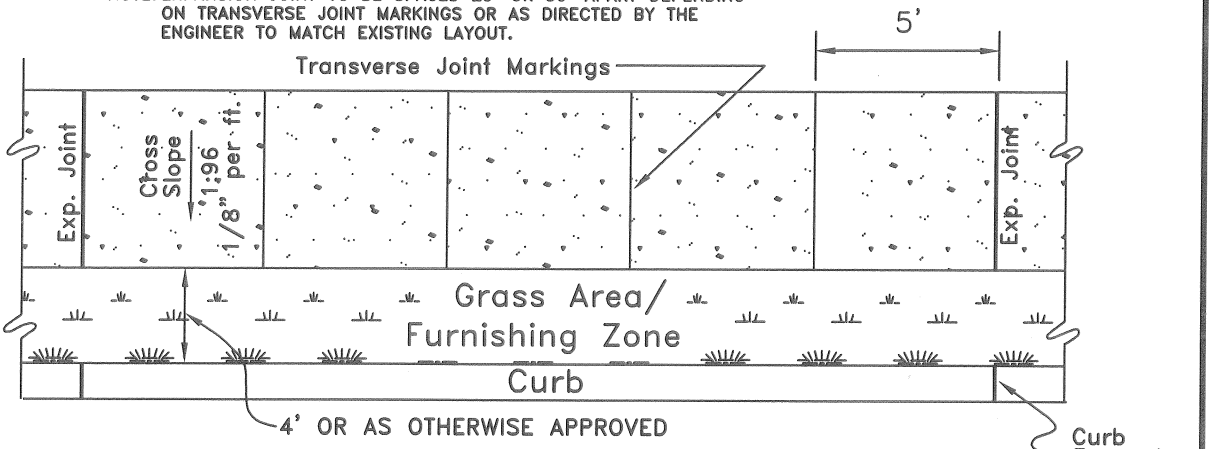



TYPICAL EXPANSION JOINT DETAIL

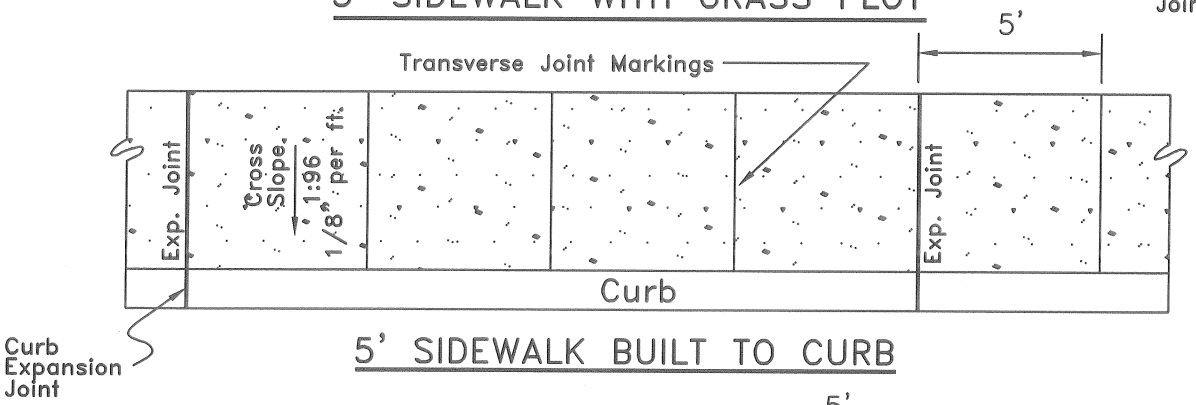
NOT TO SCALE

| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | STANDARD EXPANSION JOINT FOR CONCRETE SIDEWALK | DWG. NO. ST–209 |
|---|---|---|
| DIR. OF ENG.: Mark Macy DATE: 5/12/03 | | REVISED: 03/01/02<br>REVISED: 05/02/03<br>REVISED: |

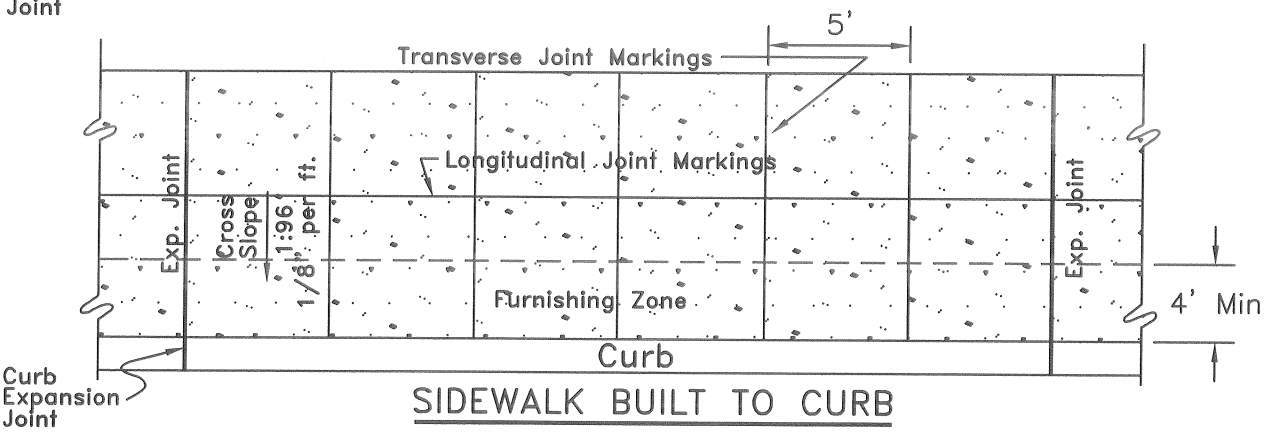
NOTE: EXPANSION JOINT TO BE SPACED 25' OR 30' APART DEPENDING ON TRANSVERSE JOINT MARKINGS OR AS DIRECTED BY THE ENGINEER TO MATCH EXISTING LAYOUT.




## 5' SIDEWALK WITH GRASS PLOT




## 5' SIDEWALK BUILT TO CURB




## SIDEWALK BUILT TO CURB

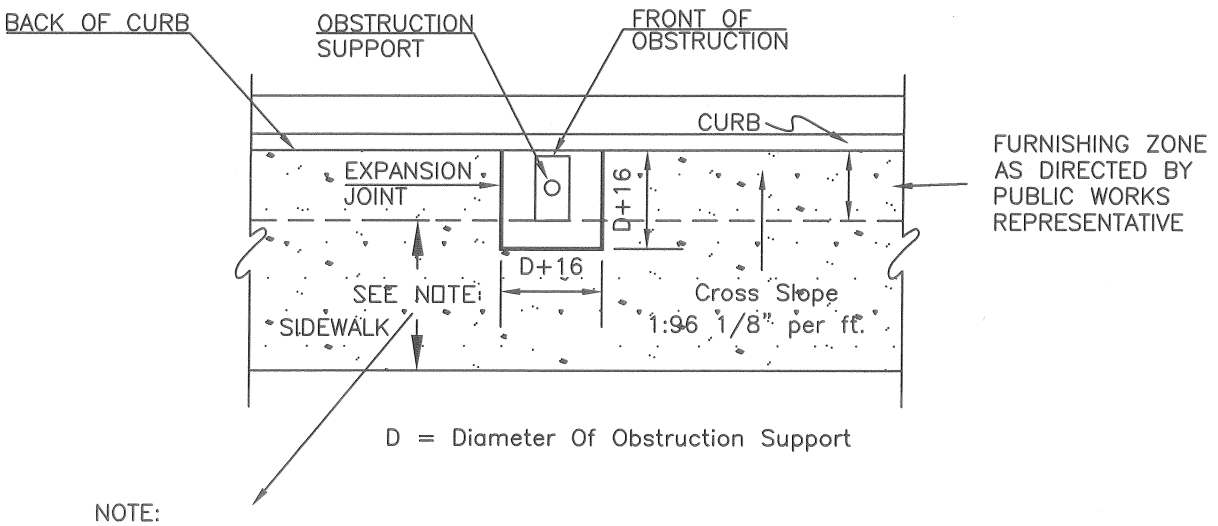
(WIDTH GREATER THAN 6')

GENERAL NOTES

1. SIDEWALKS SHALL BE A MINIMUM OF 4 INCHES IN THICKNESS.
2. MAXIMUM CROSS SLOPE FOR SIDEWALKS SHALL NOT EXCEED 1:48 (VERTICAL:HORIZONTAL).
3. SIDEWALK SHALL BE CONSTRUCTED OF WHITE CONCRETE, BRICK, OR EXPOSED AGGREGATE PER METRO DEPARTMENT OF PUBLIC WORKS TECHNICAL SPECIFICATIONS, SECTION 02522.
4. COMPACTED STONE BASE, PUG MILL MIX, 4" THICK SHALL BE APPLIED TO SUB GRADE PRIOR TO INSTALLING SIDEWALK.
5. FURNISHING ZONE IS AN AREA FOR OBSTRUCTIONS IN THE SIDEWALK. EXAMPLES ARE OUTDOOR CAFES, POWER POLES, FIRE HYDRANTS, SIGNS, ETC.
6. IN THE EVENT OF ANY CONFLICT, DISCREPENCY, OR INCONSISTENCY AMONG THE PLANS AND THESE STANDRD DETAILS, THE REQUIREMENTS OF THE STANDARD DETAILS SHALL GOVERN.

NTS

| | | |
|---|---|---|
| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | SIDEWALK CONSTRUCTION | DWG. NO. ST-210 |
| DIR. OF ENG.: Mark Macy DATE: 7/15/04 | | REVISED: 05/02/03<br>REVISED: 11/24/03<br>REVISED: 06/23/04 |




NOTE:
36" MINIMUM FOR EXISTING SIDEWALK MAINTENANCE
60" NEW SIDEWALK CONSTRUCTION

GENERAL NOTES:

1. SEE STANDARD DRAWINGS ST-209 AND ST-210 FOR EXPANSION JOINT LAYOUT, TRANSVERSE JOINT MARKINGS LAYOUT, FURNISHING ZONE, LAYOUT VARIATIONS FOR SIDEWALKS AND FURNISHING ZONE, AND GENERAL NOTES FOR SIDEWALK CONSTRUCTION.
2. ONE-HALF INCH EXPANSION JOINT MATERIAL TO BE USED.
3. COMPACTED STONE BASE, PUG MILL MIX, 4" THICK SHALL BE APPLIED TO SUBGRADE PRIOR TO INSTALLING SIDEWALK.
4. CROSS-SLOPE OF SIDEWALK SHALL NOT EXCEED 1:48 (VERTICAL:HORIZONTAL).
5. OBSTRUCTIONS NOT ALLOWED IN NEW RIGHTS-OF-WAY.
6. IN THE EVENT OF ANY CONFLICT, DISCREPENCY, OR INCONSISTENCY AMONG THE PLANS AND THESE STANDARD DETAILS, THE REQUIREMENTS OF THE STANDARD DETAILS SHALL GOVERN.

NOT TO SCALE

| | | |
|---|---|---|
| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | OBSTRUCTION IN SIDEWALK | DWG. NO. ST-211 |
| DIR. OF ENG.: Mark Macy DATE: 7/15/04 | | REVISED: 11/24/03<br>REVISED: 02/17/04<br>REVISED: 06/23/04 |

NOTES:

1. CURB RAMPS SHALL BE PROVIDED TO ALLOW ALL USERS TO MAKE THE TRANSITION IN GRADE FROM THE STREET TO THE SIDEWALK.

2. CURB RAMPS SHALL BE CONSTRUCTED TO THE DIMENSIONS AND FINISHED ELEVATIONS AS SPECIFIED IN THE PLANS AND/OR CONTRACT DOCUMENTS AND SHALL ALSO CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT. SURFACE TEXTURE OF THE CURB RAMP SHALL BE STABLE, FIRM, AND SLIP-RESISTANT. THE SURFACE SHALL BE COARSE BROOMED FINISH TRANSVERSE TO THE SLOPE OF THE RAMP. CARE SHALL BE TAKEN TO ASSURE AN UNIFORM GRADE ON THE CURB RAMP. LONGITUDINAL AND TRANSVERSE JOINT MARKINGS SHALL NOT BE ALLOWED ON THE LANDINGS OR RAMPS.

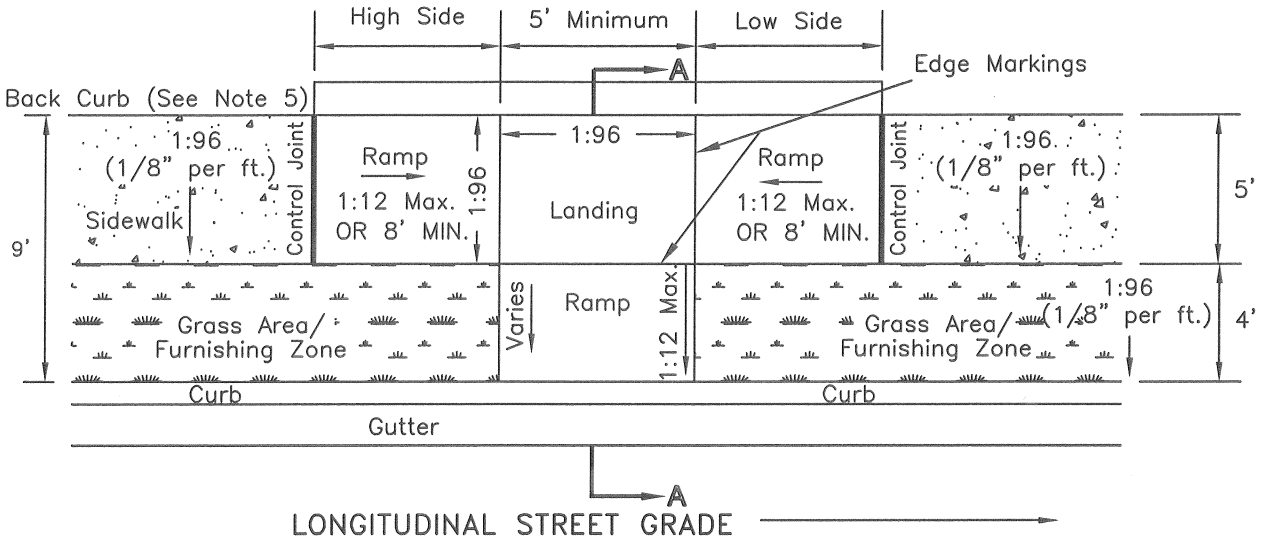
3. DRAINAGE AND UTILITY STRUCTURES SHALL NOT BE PLACED IN CURB RAMP OR LANDING.

4. THE GUTTER LINE PROFILE OF THE STREET SHALL BE MAINTAINED THROUGH THE AREA OF THE CURB RAMP.

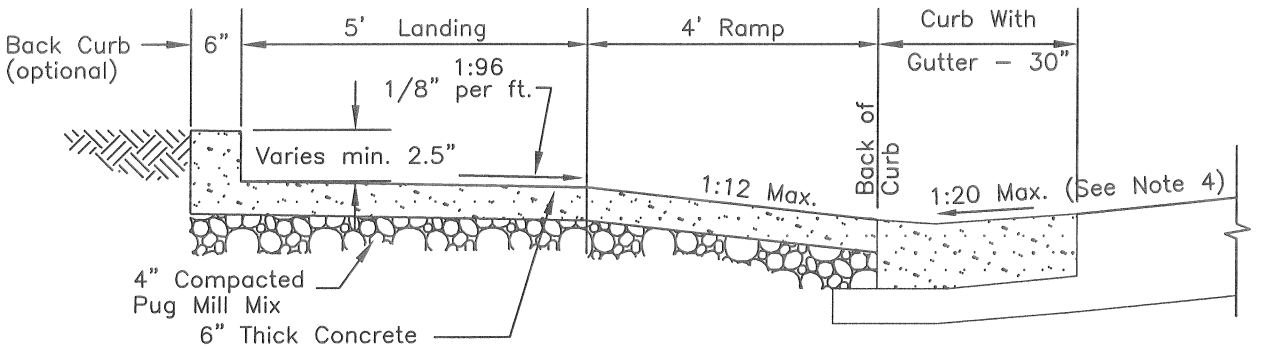
5. THE FURNISHING ZONE BUFFERS PEDESTRIANS FROM THE ADJACENT ROADWAY, AND IS ALSO THE AREA WHERE ELEMENTS SUCH AS STREET TREES, SIGNAL POLES, UTILITY POLES, STREET LIGHTS, CONTROLLER BOXES, HYDRANTS, SIGNS, PARKING METERS, DRIVEWAY APRONS, GRATES, HATCH COVERS, AND STREET FURNITURE ARE PROPERLY LOCATED.

| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | STANDARD CURB RAMP NOTES | DWG. NO. ST-215 |
|---|---|---|
| ASST. DIR. ENG.: Mark Macy DATE: 11/21/00<br>DIRECTOR: Randall D. Hoy DATE: 11-20-00 | | REVISED: 11/10/00 |

## PLAN VIEW




## LONGITUDINAL STREET GRADE




## SECTION A–A

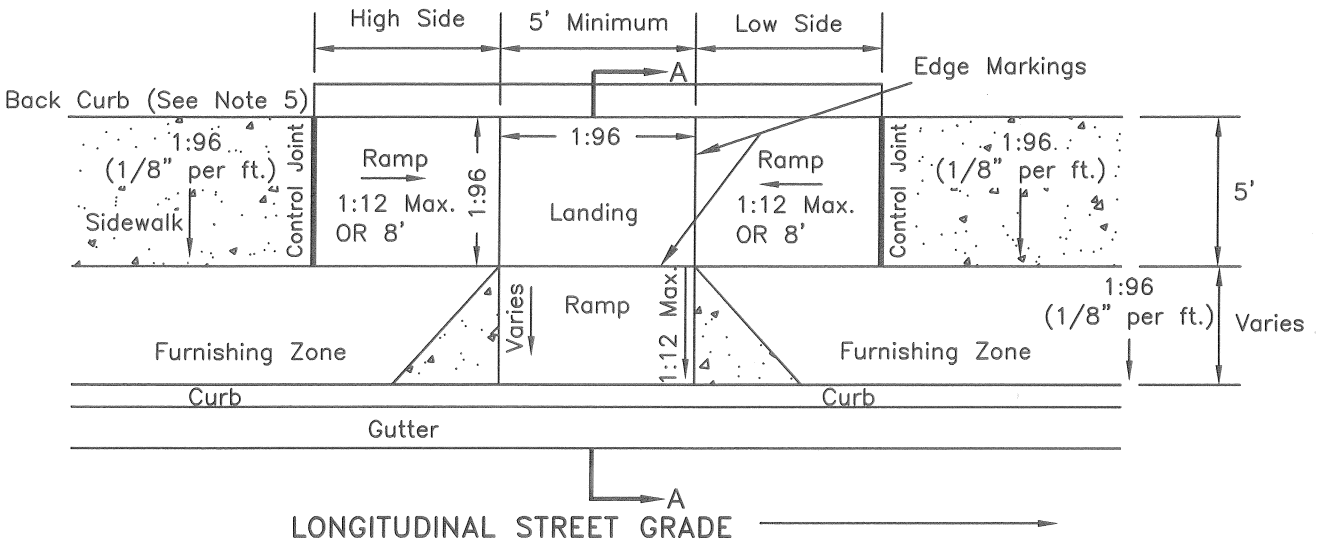
NOT TO SCALE

GENERAL NOTES

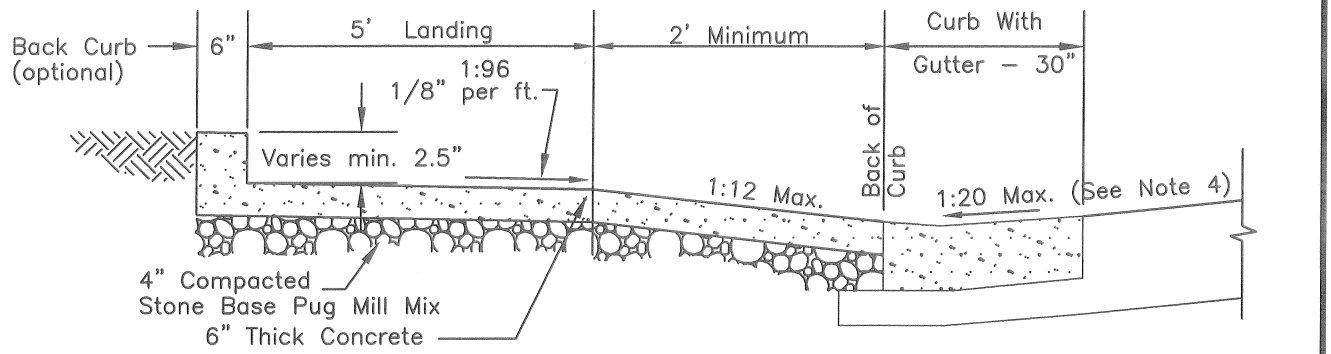
1. Ramp shall be flush with the gutter or edge of pavement.
2. Cross–slope of landing and of sidewalk shall not exceed 1:48 (vertical:horizontal).
3. Surface texture of the curb ramp shall be stable, firm, and slip–resistant. The surface shall be coarse broomed "white" concrete finish transverse to the slope of the ramp.
4. The normal gutter slope of 1:12 (vertical:horizontal) shall be reduced to 1:20 (vertical:horizontal) at the ramp when the curb and gutter is poured before the ramp, or the gutter at the ramp must be cut out, removed, and repoured when the ramp is poured.
5. Back curb shall be constructed at the direction of Public Works, and if required, back curb height along ramp shall transition from 0 inches at expansion joints to the proposed height of back curb at landing and shall be a constant height through landing. Deletion of back curb requires approval of inspector. Removal to be noted in project file and on inspection report.
6. High side and low side ramps shall have a maximum slope of 1:12 (vertical:horizontal) or shall be 8 feet (96 inches) minimum in length.

| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | NEW CONSTRUCTION CURB RAMP | DWG. NO. ST–320 |
|---|---|---|
| DIR. OF ENG.: Mark Macy DATE: 5/12/03 | | REVISED: 07/18/02<br>REVISED: 05/08/03<br>REVISED: |

## PLAN VIEW




## LONGITUDINAL STREET GRADE




## SECTION A–A

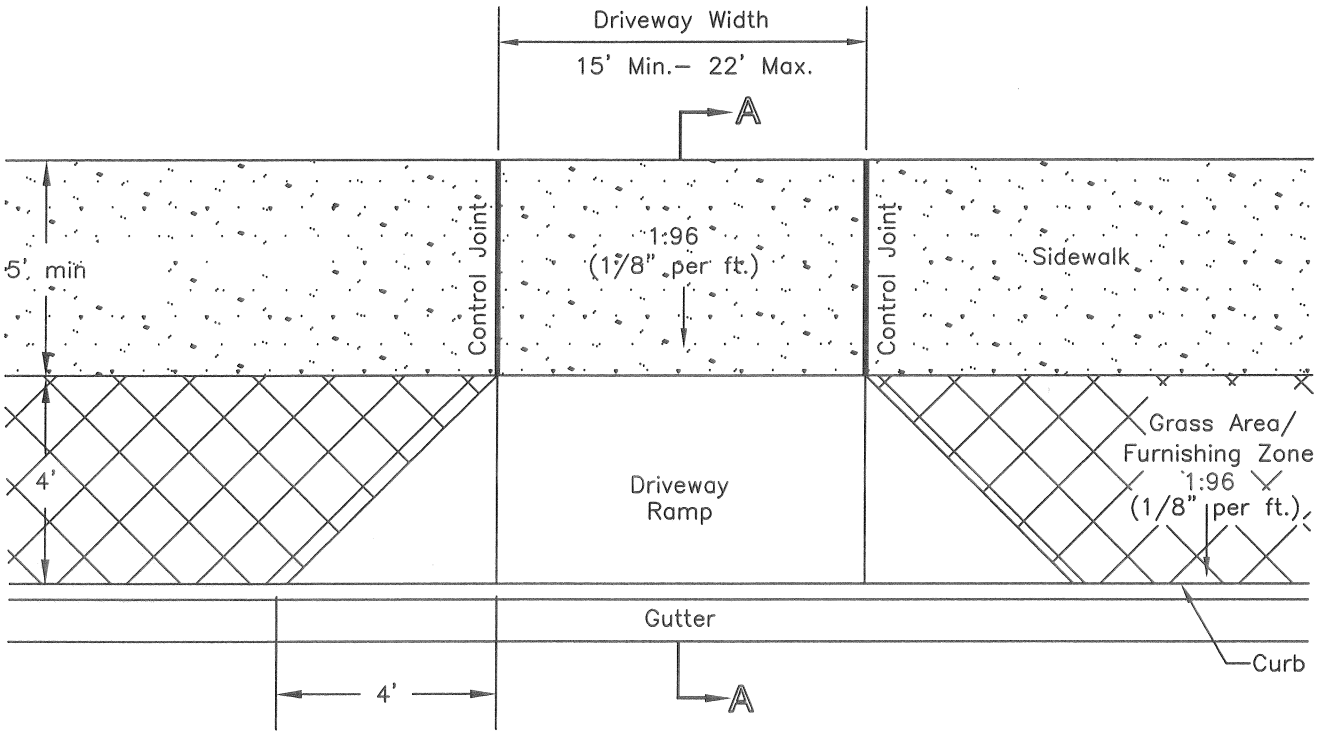
NOT TO SCALE

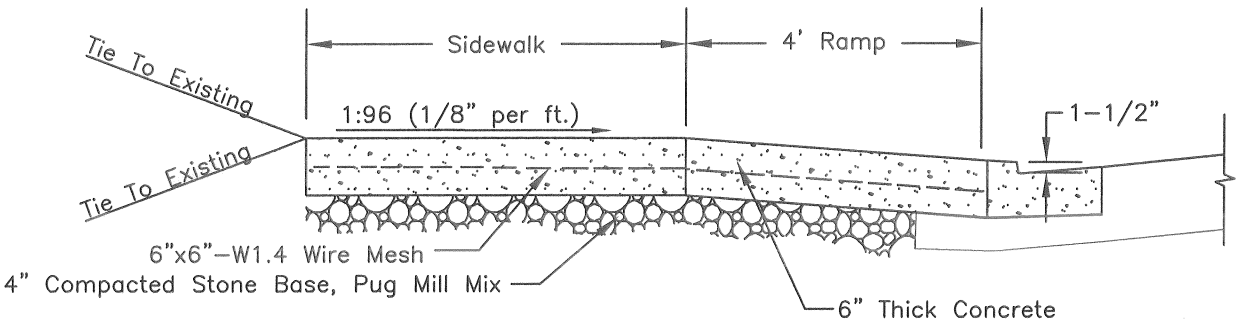
GENERAL NOTES

1. Ramp shall be flush with the gutter or edge of pavement.
2. Cross–slope of landing and of sidewalk shall not exceed 1:48 (vertical:horizontal).
3. Surface texture of the curb ramp shall be stable, firm, and slip–resistant. The surface shall be coarse broomed "white" concrete finish transverse to the slope of the ramp.
4. The normal gutter slope of 1:12 (vertical:horizontal) shall be reduced to 1:20 (vertical:horizontal) at the ramp when the curb and gutter is poured before the ramp, or the gutter at the ramp must be cut out, removed, and repoured when the ramp is poured.
5. Back curb shall be constructed at the direction of Public Works, and if required, back curb height along ramp shall transition from 0 inches at expansion joints to the proposed height of back curb at landing and shall be a constant height through landing. Deletion of back curb requires approval of inspector. Removal to be noted in project file and on inspection report.
6. High side and low side ramps shall have a maximum slope of 1:12 (vertical:horizontal) or shall be 8 feet (96 inches) in length.

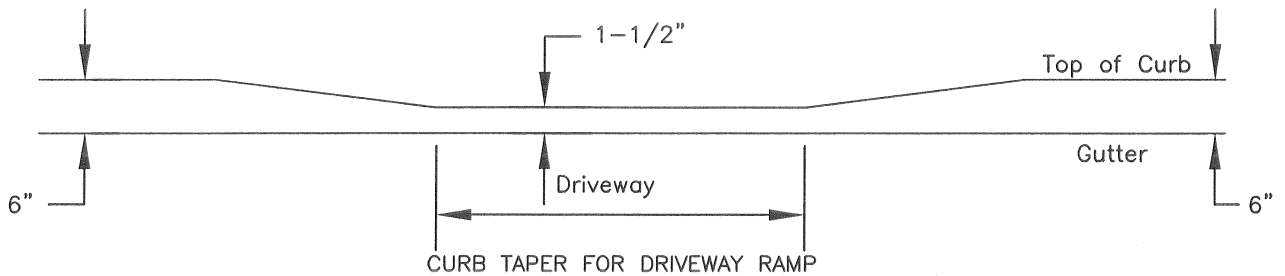
| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | ALTERATION CONSTRUCTION CURB RAMP WITH SIDEWALK LESS THAN 9 FEET | DWG. NO. ST–321 |
|---|---|---|
| DIR. OF ENG.: Mark Macy DATE: 7/15/04 | | REVISED: 06/30/03<br>REVISED: 07/31/02<br>REVISED: 05/08/03 |

## PLAN VIEW




## SECTION A-A



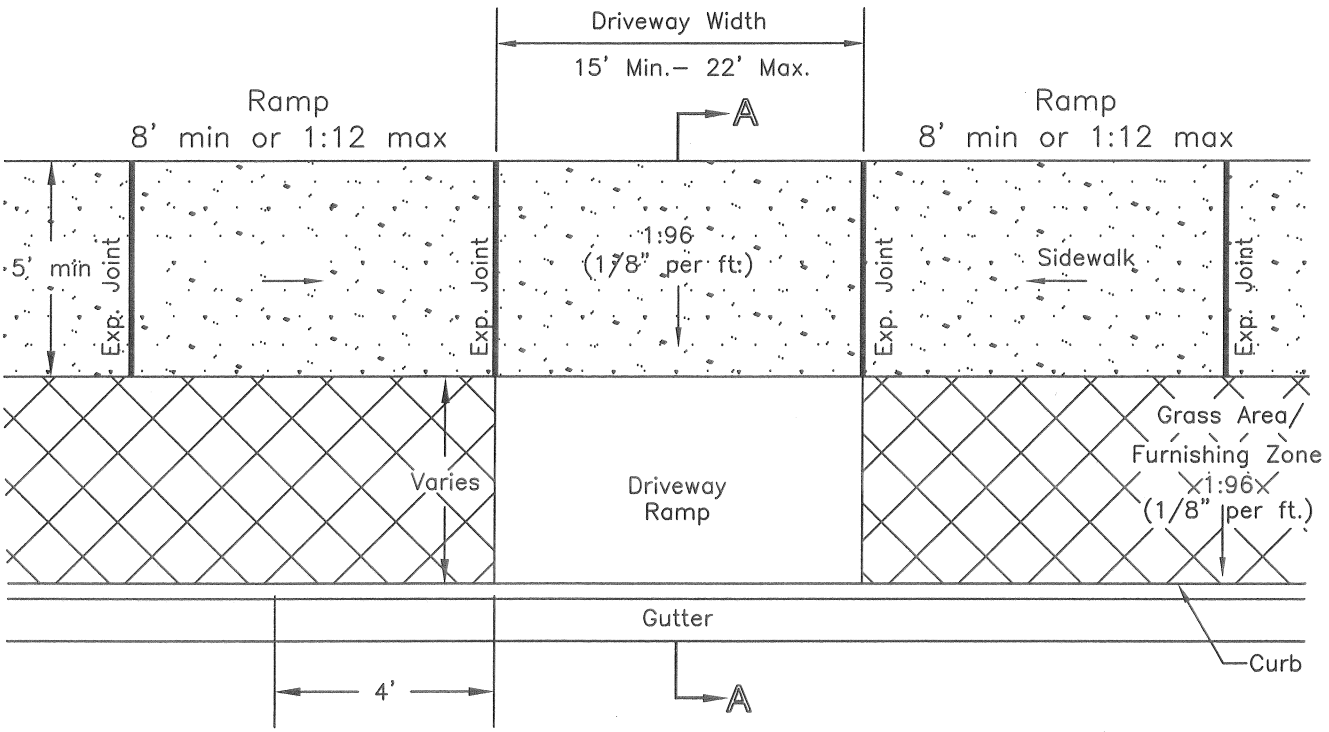

CURB TAPER FOR DRIVEWAY RAMP

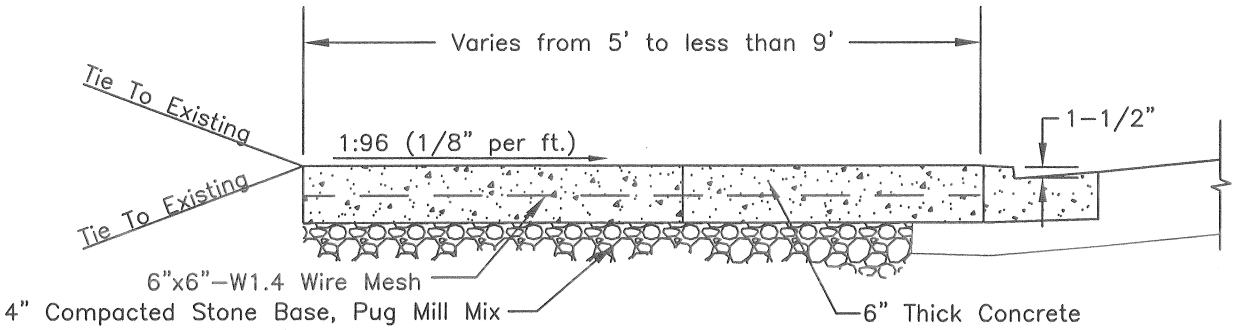
NOTE:
1. Cross–slope of sidewalk shall not exceed 1:48 (vertical:horizontal).
2. Fiber mesh reinforcement is an approved alternative for the wire mesh. Fiber mesh reinforcement will be added to the concrete at the batch plant at the rate of 1 1/2 pounds per cubic yard.
3. Concrete shall be 6 inches thick

NOT TO SCALE

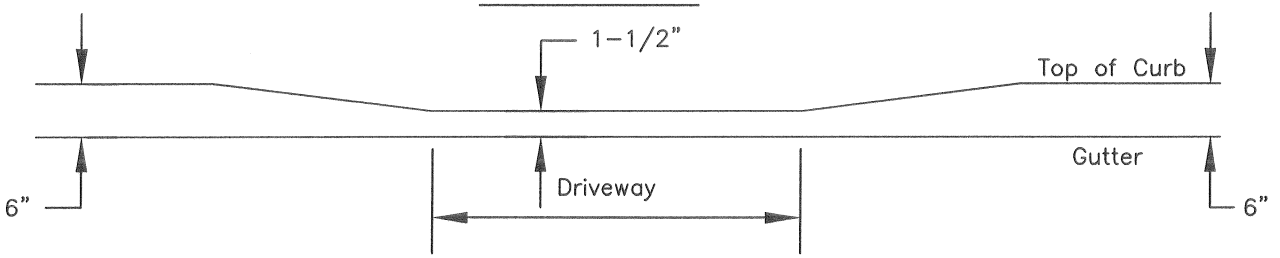
| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | NEW CONSTRUCTION RESIDENTIAL DRIVEWAY RAMP | DWG. NO. ST–322 |
|---|---|---|
| DIR. OF ENG.: Mark Macy DATE: 5/12/03 | | REVISED: 07/27/02<br>REVISED: 05/08/03<br>REVISED: |

## PLAN VIEW




## SECTION A-A



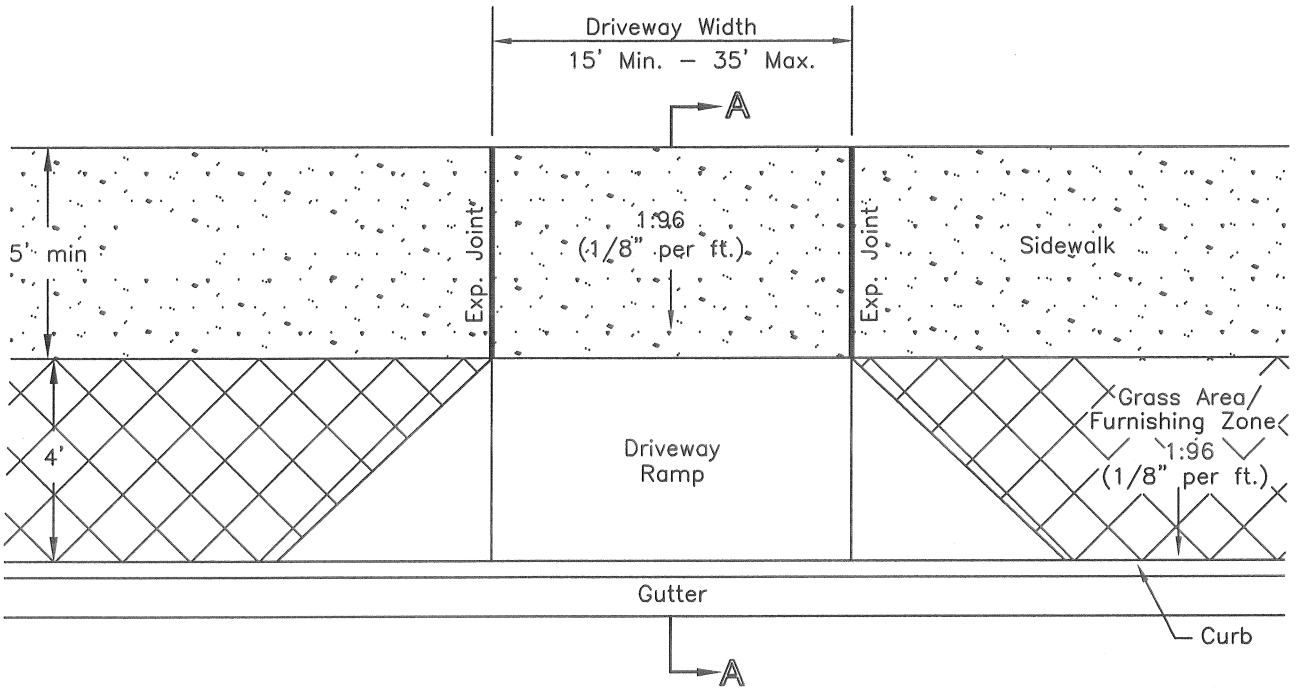

**CURB TAPER FOR DRIVEWAY RAMP**

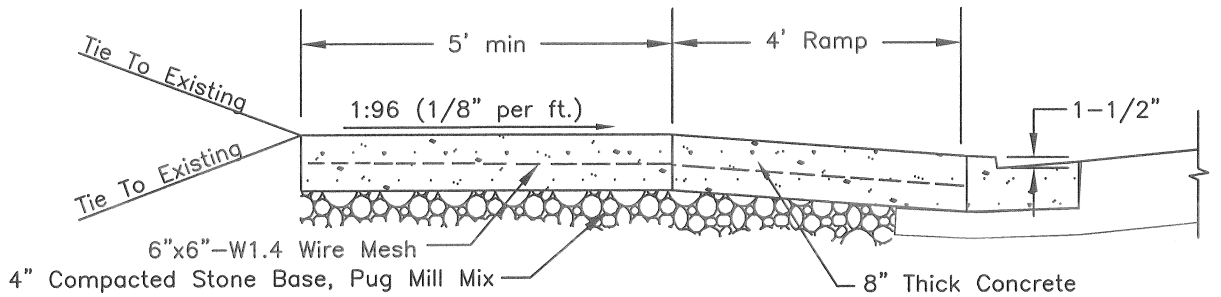
NOTE:
1. Cross–slope of sidewalk shall not exceed 1:48 (vertical:horizontal).
2. Fiber mesh reinforcement is an approved alternative for the wire mesh. Fiber mesh reinforcement will be added to the concrete at the batch plant at the rate of 1 1/2 pounds per cubic yard.
3. Concrete shall be 6 inches thick.

NOT TO SCALE

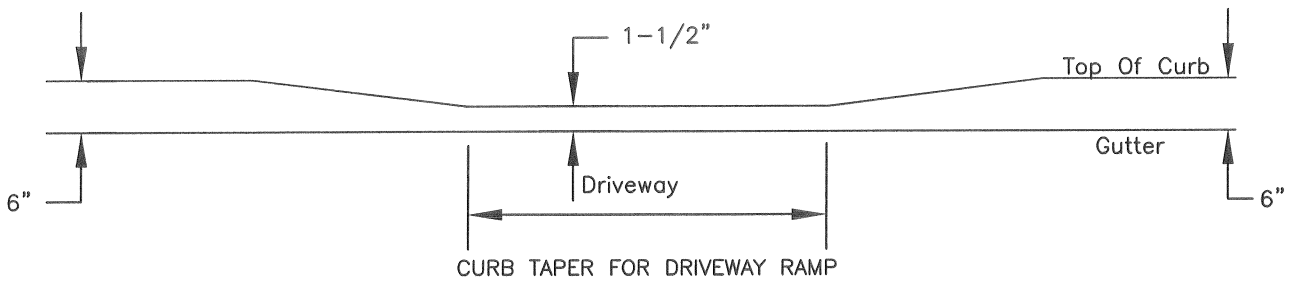
| | | |
|---|---|---|
| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | ALTERATION CONSTRUCTION RESIDENTIAL DRIVEWAY RAMP WITH SIDEWALK LESS THAN 9 FEET | DWG. NO. ST–323 |
| DIR. OF ENG.: Mark Sievers DATE: 5/12/03 | | REVISED: 01/27/03<br>REVISED: 05/08/03<br>REVISED: |

## PLAN VIEW




## SECTION A-A



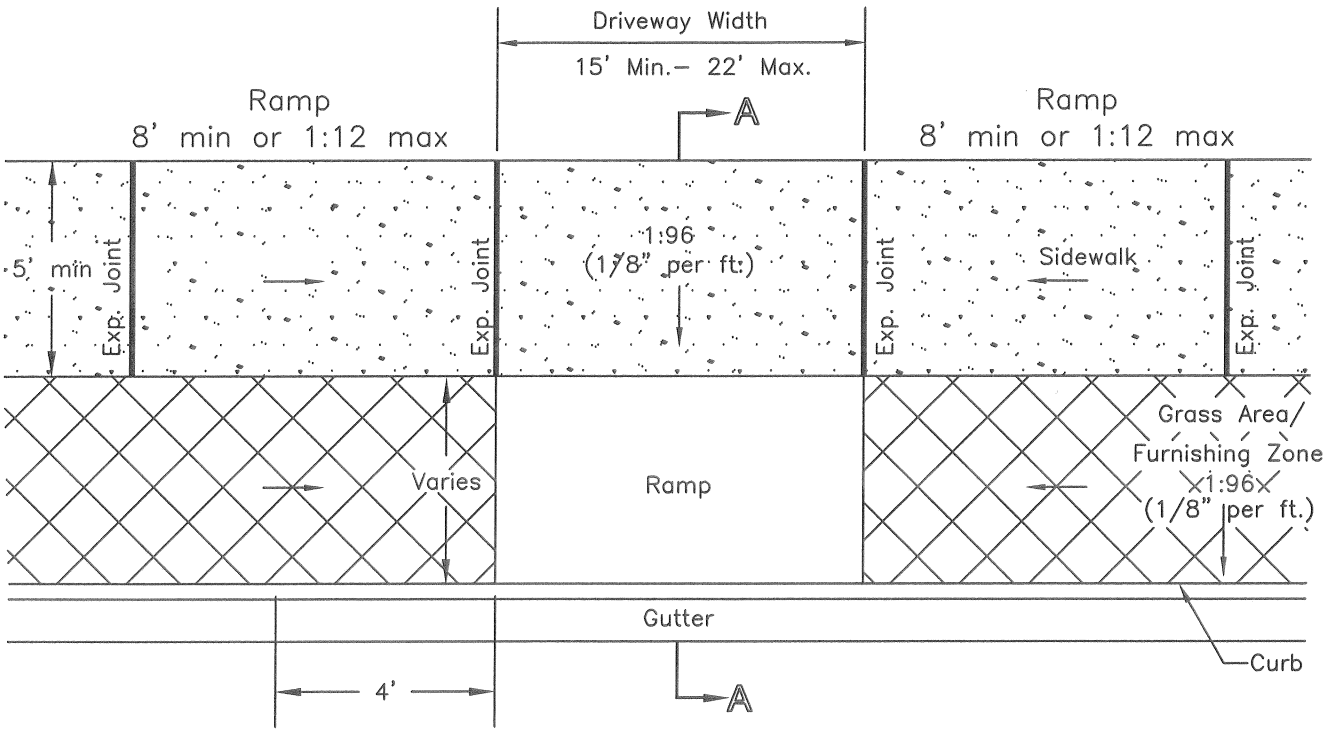

CURB TAPER FOR DRIVEWAY RAMP

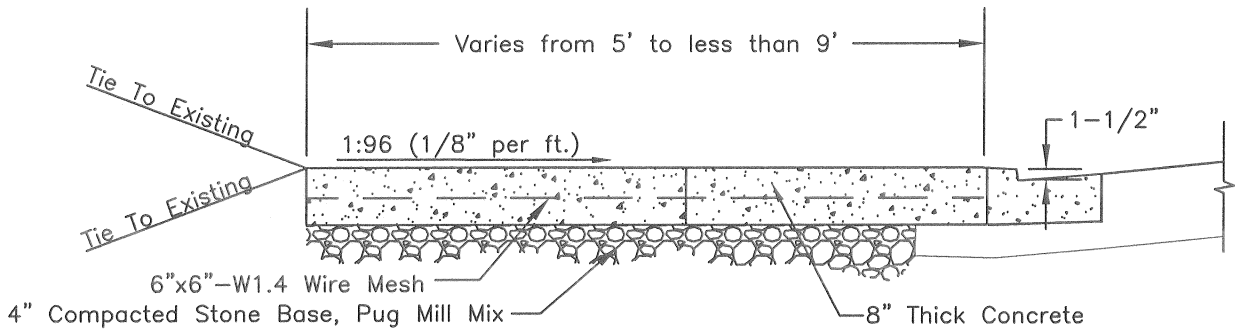
NOTE:
1. Cross–slope of sidewalk shall not exceed 1:48 (vertical:horizontal).
2. Fiber mesh reinforcement is an approved alternative for the wire mesh. Fiber mesh reinforcement will be added to the concrete at the batch plant at the rate of 1 1/2 pounds per cubic yard.
3. Concrete shall be 8 inches thick.

NOT TO SCALE

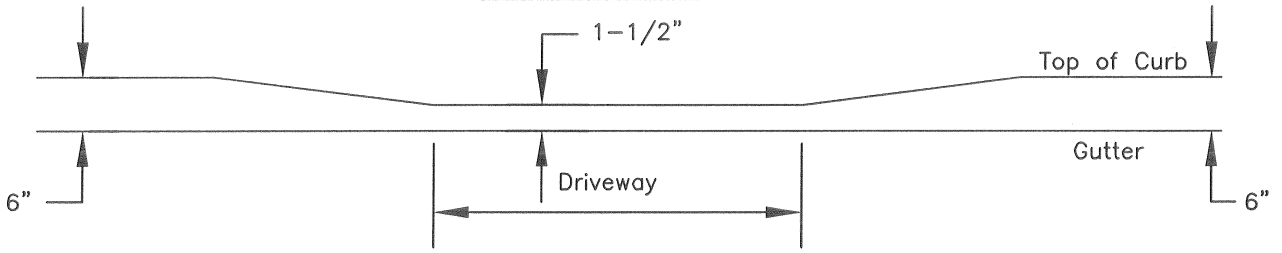
| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | NEW CONSTRUCTION COMMERCIAL DRIVEWAY RAMP | DWG. NO. ST–324 |
|---|---|---|
| DIR. OF ENG.: Mark Macy DATE: 5/12/03 | | REVISED: 07/27/02<br>REVISED: 05/08/03<br>REVISED: |

## PLAN VIEW




## SECTION A-A

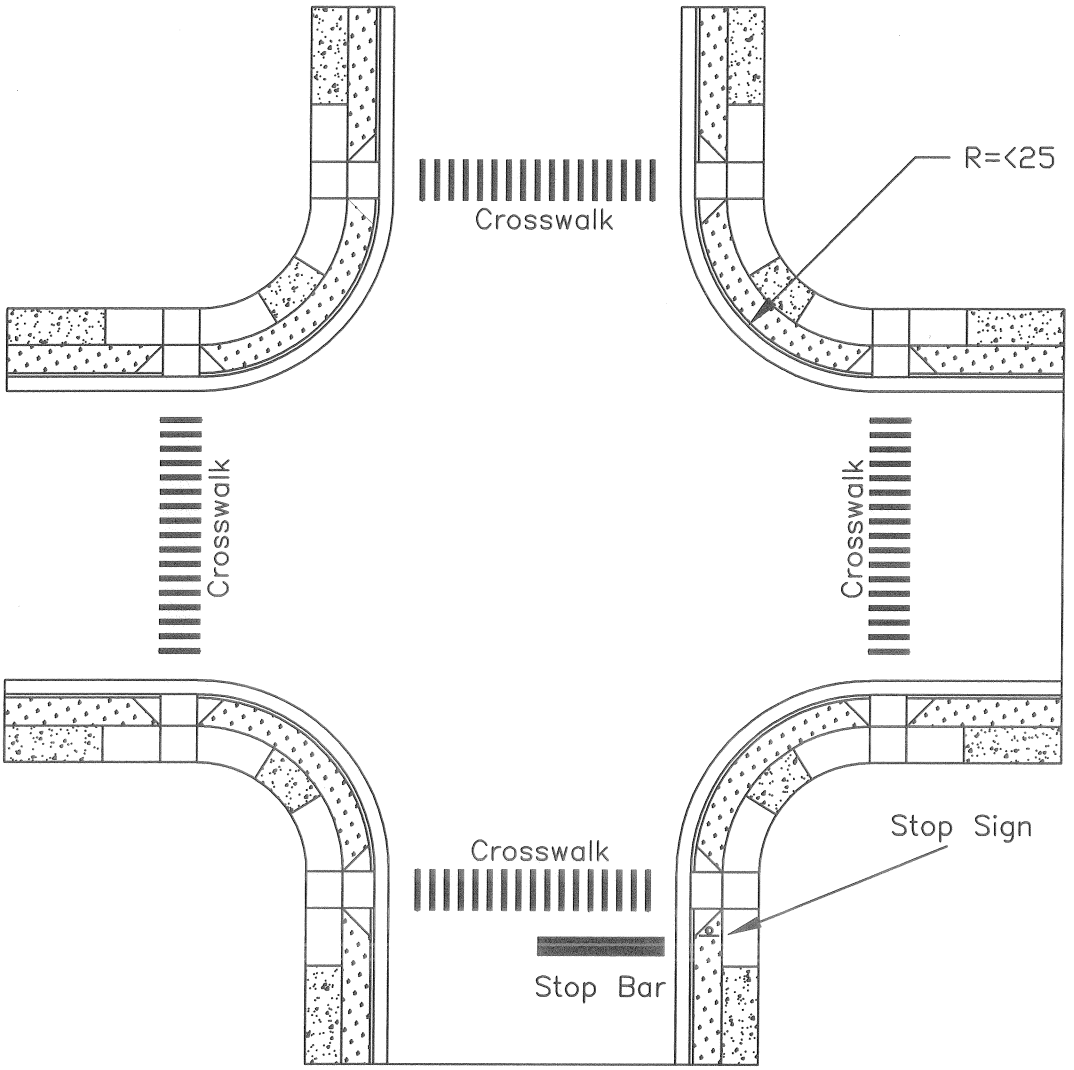



**CURB TAPER FOR DRIVEWAY RAMP**

NOTE:
1. Cross–slope of sidewalk shall not exceed 1:48 (vertical:horizontal).
2. Fiber mesh reinforcement is an approved alternative for the wire mesh. Fiber mesh reinforcement will be added to the concrete at the batch plant at the rate of 1 1/2 pounds per cubic yard.
3. Concrete shall be 8 inches thick.

NOT TO SCALE

| | | |
|---|---|---|
| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | ALTERATION CONSTRUCTION COMMERCIAL DRIVEWAY RAMP WITH SIDEWALK LESS THAN 9 FEET | DWG. NO. ST–325 |
| DIR. OF ENG.: Mark Macy DATE: 5/12/03 | | REVISED: 01/27/03<br>REVISED: 05/08/03<br>REVISED: |

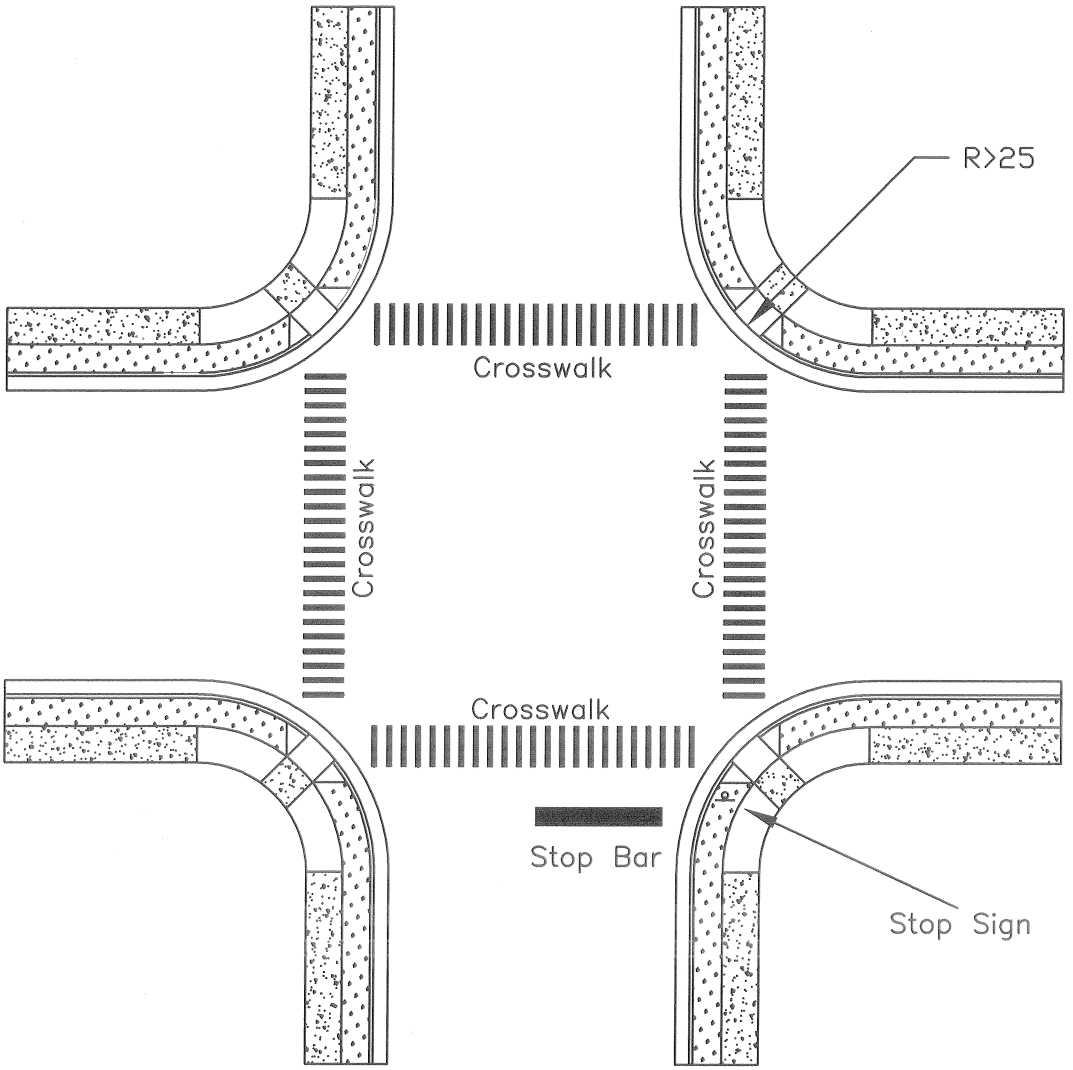



GENERAL NOTES

1. GEOMETRIC LAYOUT IS FOR CURB RADIUS EQUAL TO OR LESS THAN 25'.
2. SEE NOTES FOR GEOMETRIC LAYOUT AT CURB (ST-328)
3. IN THE EVENT OF ANY CONFLICT, DISCREPENCY, OR INCONSISTENCY AMONG THE PLANS AND THESE STANDARD DETAILS, THE REQUIREMENTS OF THE STANDARD DETAILS SHALL GOVERN.

NOT TO SCALE

| | | |
|---|---|---|
| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | GEOMETRIC LAYOUT AT CURB RETURNS WITH RADIUS 25' OR LESS | DWG. NO. ST-326 |
| DIR. OF ENG.: Mark Macy DATE: 7/15/04 | | REVISED: 11/24/03<br>REVISED: 02/17/04<br>REVISED: 06/23/04 |




GENERAL NOTES

1. GEOMETRIC LAYOUT IS FOR CURB RADIUS GREATER THAN 25'.
2. SEE NOTES FOR GEOMETRIC LAYOUT AT CURB (ST-328)
3. IN THE EVENT OF ANY CONFLICT, DISCREPENCY, OR INCONSISTENCY AMONG THE PLANS AND THESE STANDARD DETAILS, THE REQUIREMENTS OF THE STANDARD DETAILS SHALL GOVERN.

NOT TO SCALE

| | | |
|---|---|---|
| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | GEOMETRIC LAYOUT AT CURB RETURNS WITH RADIUS GREATER THAN 25' | DWG. NO. ST-327 |
| DIR. OF ENG.: Mark Macy DATE: 7/15/04 | | REVISED: 11/24/03<br>REVISED: 02/17/04<br>REVISED: 06/23/04 |

NOTES:

1. SEE CURB RAMP STANDARD DRAWINGS FOR CONSTRUCTION DETAILS.

2. CURB RAMPS AT MARKED CROSSINGS SHALL BE WHOLLY CONTAINED WITHIN THE MARKINGS.

3. ALL MARKINGS TO CONFORM TO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

4. ALL PAVEMENT MARKINGS TO BE THERMOPLASTIC.

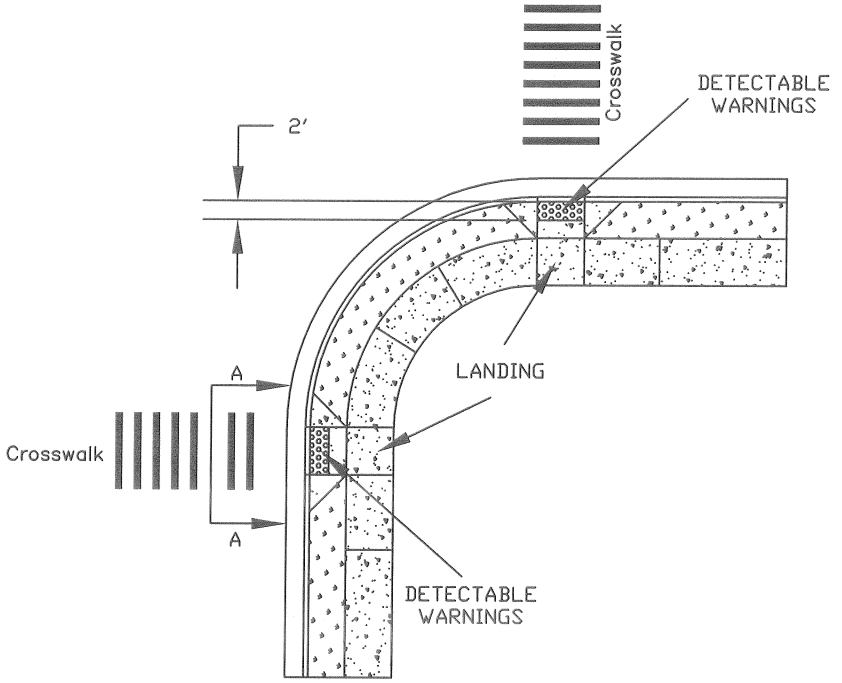
5. ALL SIGNS SHALL BE 3M HIGH INTENSITY REFLECTIVE MATERIAL.

6. STOP LINE TO BE MARKED WHEN REQUIRED BY METRO ENGINEER.

7. CROSSWALKS TO BE MARKED WHEN REQUIRED BY THE METRO ENGINEER.

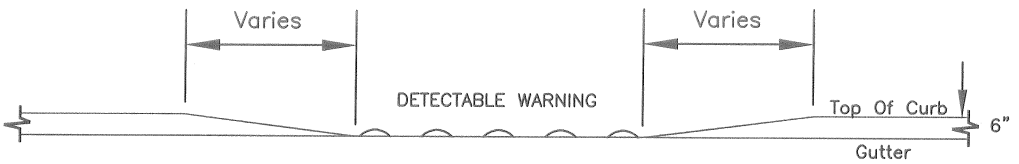
8. IN THE EVENT OF ANY CONFLICT, DISCREPENCY, OR INCONSISTENCY AMONG THE PLANS AND THESE STANDARD DETAILS, THE REQUIREMENTS OF THE STANDARD DETAILS SHALL GOVERN.

| | | |
|---|---|---|
| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | GEOMETRIC LAYOUT AT CURB NOTES | DWG. NO. ST-328 |
| DIR. OF ENG.: Mark Macy DATE: 5/2/07 | | REVISED: 11/10/00<br>REVISED: 06/23/04<br>REVISED: 05/02/07 |




PLAN VIEW

SECTION A–A

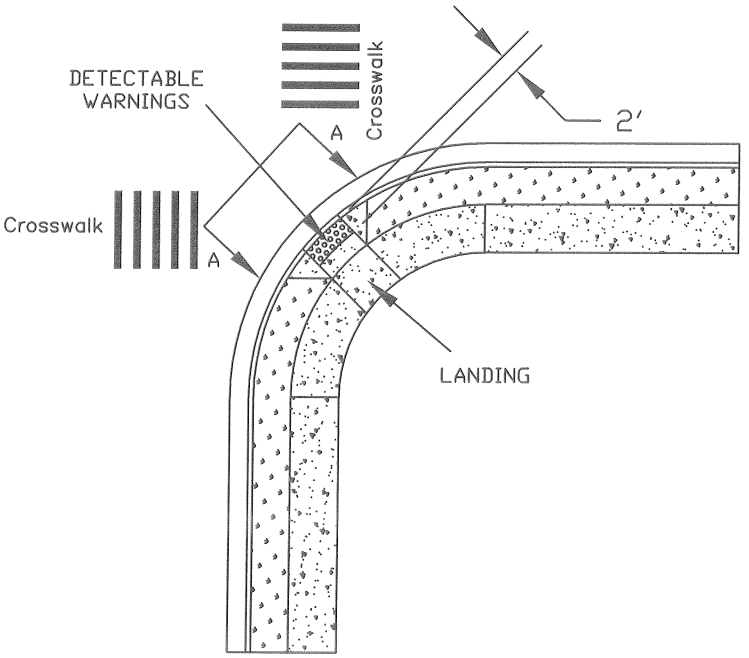



GENERAL NOTES

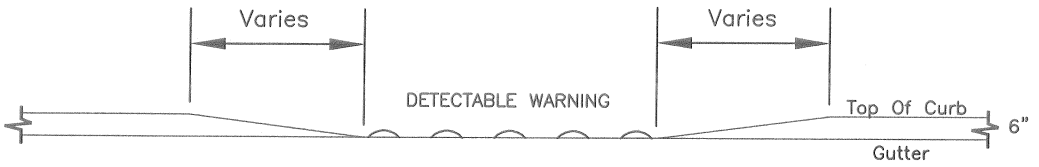
1. FOR CURB RADIUS EQUAL TO OR LESS THAN 25'.
2. SEE CURB RAMP STANDARD DRAWINGS FOR CONSTRUCTION DETAILS.
3. ALL MARKINGS TO CONFORM TO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
4. THE LAYOUT, SIZE, DIMENSIONS, HEIGHT OF THE DETECTABLE WARNINGS SHALL MEET THE LATEST DESIGN STANDARDS AS ISSUED BY THE ACCESS BOARD.
5. THE DETECTABLE WARNINGS AND INSTALLATIONS SHALL MEET THE MPW SPECIFICATION 02523.
6. IN THE EVENT OF ANY CONFLICT, DISCREPANCY, OR INCONSISTENCY AMONG THE PLANS AND THESE STANDARD DETAILS, THE REQUIREMENTS OF THE STANDARD DETAILS SHALL GOVERN.
7. THE COLOR OF THE DETECTABLE WARNING STRIP SHALL BE "SAFETY YELLOW".

NOT TO SCALE

| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | DETECTABLE WARNINGS AT CURB RETURNS WITH RADIUS 25' OR LESS | DWG. NO. ST-329 |
|---|---|---|
| DIR. OF ENG.: Mark Sturdy DATE: 6/17/05 | | REVISED: 06/17/05<br>REVISED: 08/13/04<br>REVISED: |




PLAN VIEW




SECTION A–A

GENERAL NOTES

1. FOR CURB RADIUS GREATER THAN 25'.
2. SEE CURB RAMP STANDARD DRAWINGS FOR CONSTRUCTION DETAILS.
3. ALL MARKINGS TO CONFORM TO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
4. THE LAYOUT, SIZE, DIMENSIONS, HEIGHT OF THE DETECTABLE WARNINGS SHALL MEET THE LATEST DESIGN STANDARDS AS ISSUED BY THE ACCESS BOARD.
5. THE DETECTABLE WARNINGS AND INSTALLATIONS SHALL MEET THE MPW SPECIFICATION 02523.
6. IN THE EVENT OF ANY CONFLICT, DISCREPANCY, OR INCONSISTENCY AMONG THE PLANS AND THESE STANDARD DETAILS, THE REQUIREMENTS OF THE STANDARD DETAILS SHALL GOVERN.
7. THE COLOR OF THE DETECTABLE WARNING STRIP SHALL BE "SAFETY YELLOW".

NOT TO SCALE

| METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY DEPARTMENT OF PUBLIC WORKS | DETECTABLE WARNINGS AT CURB RETURNS WITH RADIUS GREATER THAN 25' | DWG. NO. ST-330 |
|---|---|---|
| DIR. OF ENG.: Mark Macy DATE: 6/17/05 | | REVISED: 06/17/05<br>REVISED: 08/13/04<br>REVISED: |

# SECTION 02523
# Detectable Warnings

## PART 1 - GENERAL

### 1.1 DESCRIPTION OF WORK

This Work shall consist of installing detectable warnings by surface application or by cast in place on a prepared surface in accordance with TDOT Standard Specifications Section 701 and this Section and in reasonably close conformity with the lines and grades shown in the plans or established by the Engineer.

### 1.2 RELATED WORK SPECIFIED ELSEWHERE

Section 01710 - Cleanup and Restoration
Section 02520 - Cement Concrete Curb, Gutter, and Combined Curb and Gutter Section 02522 - Concrete Walks, Driveways, and Ramps

### 1.3 APPLICABLE SPECIFICATIONS

"STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", Latest Revision, Tennessee Department of Transportation (TDOT)

"SUBDIVISION SPECIFICATIONS FOR STREETS AND ROADS", Latest Revision, Metropolitan Government of Nashville and Davidson County

### 1.4 APPLICABLE REFERENCES

"American Association of State Highway and Transportation Officials" (AASHTO), Latest Revision

"Americans with Disabilities Act" (ADA), Latest Revision

“Americans with Disabilities Act Accessibility Guidelines” (ADAAG), Latest Revision

“Architectural Barriers Act” (ABA), Latest Revision

“Draft Public Rights-of-Way Accessibility Guidelines”, June 17, 2002, ADAAG

Public Works policy and procedure for detectable warnings installation, Latest Revision

### 1.5 APPROVED LIST

| Company | Product |
|---|---|
| Flint Trading, Inc.<br>115 Todd Court<br>P.O. Box 160<br>Thomasville, NC 27361-0160<br>336-475-6600 | Top Mark Preformed Thermoplastic Detectable Warning for surface applied construction. |

| Company | Product |
|---|---|
| Engineering Plastics, Inc.<br>300 International Drive<br>Suite 100<br>Williamsville, NY 14221<br>916-549-9700 | Armor-Tile Detectable Warning Strips for cast-in place and surface applied construction. |
| Detectable Warning Systems, Inc.<br>6435 Joshua Tree Avenue<br>Orange, CA 92867<br>866-999-7452 | E-Z Set Warning Panels for cast-in-place construction |
| Transpo Industries, Inc.<br>20 Jones Street<br>Rochelle, NY 10801<br>914-636-1000 | Step-Safe Precast Polymer Concrete Tactile Dome Safety Tile for cast-in-place construction |
| ADA Solutions, Inc.<br>10 Elizabeth Drive - Unit 5<br>Chelmsford MA 01824<br>800·372·0519 \| 978·262·9125 (fax)<br>http://www.adatile.com | Detectable Warning Strips for cast-in place and surface applied construction. |

Or approved equal

## PART 2 - MATERIALS

### 2.1 GENERAL REQUIREMENTS

Layout of the detectable warnings shall meet the requirements in the "Draft Public Rights-of-Way Accessibility Guidelines", June 17, 2002, ADAAG.

### 2.2 MATERIAL

The material used for the detectable warnings shall be an integral part of the walking surface and shall contrast visually with adjoining surfaces. The materials for the detectable warnings shall meet the manufacture's requirements of section 1.5.

### 2.3 DOME SIZE AND DIMENSIONS

A. Size. The truncated domes in a detectable warning surface shall have a base diameter of 0.9 inches minimum to 1.4 inches maximum, a top diameter of 50% of the base diameter minimum to 65% of the base diameter maximum, and a height of 0.2 inches.

B. Alignment. Domes shall be aligned on a square grid in the predominant direction of travel to permit wheels to roll between domes.

C. Spacing. Truncated domes in a detectable warning surface shall have a center-to-center spacing of 1.6 inches minimum and 2.4 inches maximum, and a base-to-base spacing of 0.65 inches minimum, measured between the most adjacent domes on square grid.

## 2.4 VISUAL CONTRAST

The visual contrast between the detectable warning and an adjoining surface will be either light-on-dark or dark-on-light. The material used to provide visual contrast shall be an integral part of the detectable warning surface.

## 2.5 PLACEMENT

A. Detectable warnings will be built in or applied on the ramp that is from the landing to the roadway.

B. The detectable warning surface shall be located so that the edge nearest the curb line or other potential hazard is 6 inches minimum to 8 inches maximum from the curb line or other potential hazard.

C. Detectable warnings shall be 24 inches in the direction of travel and extend the full width of the curb ramp, blended transition, or depressed curb. A depressed curb is a curb that has a height less than or equal to $^{1}/_{4}$".

## 2.6 LOCATION

A. Detectable warnings shall be installed where a sidewalk crosses a vehicular way, excluding unsignalized driveway crossings.

B. Detectable warnings shall be installed where a rail system crosses pedestrian facilities that are not shared with vehicular ways.

C. Detectable warnings shall be installed at islands and medians that are within the roadway.

D. Detectable warnings shall be installed where required by proposed Chapter 11 of the "Draft Public Rights-of-Way Accessibility Guidelines", June 17, 2002, ADAAG, by the Access Board.

# PART 3 - EQUIPMENT

The equipment used for the installation of the detectable warnings is to be as specified by the manufacture's recommendations as listed in Section 1.5.

## PART 4 – EXECUTION

### 4.1 GENERAL REQUIREMENTS

The installation of the detectable warnings is to be as specified by the manufacture's recommendations as listed in Section 1.5.

### 4.2 SURFACE APPLIED PROCESS

Surface applied detectable warnings occur after the surface that is to receive the detectable warnings has cured. The surface will be prepared as per the manufacture's recommendations.

Detectable Warning Strips

### 4.3 CAST-IN-PLACE PROCESS

Cast-in-place applied detectable warnings occur during the installation of the surface that is to receive the detectable warnings.

### 4.4 FINISHING

The detectable warnings shall be installed in reasonably close conformity with the lines and grades shown in the plans or established by the Engineer.

### 4.5 FINAL CLEANUP

Final cleanup shall be performed in accordance with the requirements in TDOT Standard Specifications Subsection 104.11 and in Section 01710 - Cleanup and Restoration. The detectable warnings shall be cleaned of all excess materials and debris.

## PART 5 - MEASUREMENT AND PAYMENT

### 5.1 METHOD OF MEASUREMENT

A. Detectable warnings will be measured by the square foot complete in place. The area shall be obtained by surface measurements. Where standard widths are constructed the measurements shall not exceed the standard widths shown in the plans unless on written direction of the Engineer.

B. No measurement for payment will be made for preparing the surface to receive the detectable warnings unless otherwise indicated in the plans.

### 5.2 BASIS OF PAYMENT

The accepted quantities of detectable warnings will be paid for at the Contract Unit Bid Price per square foot complete in place.

**END OF SECTION – 02523**

# APPENDIX C

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## CURB RAMP REPORT TEMPLATE & SAMPLE INSPECTION REPORTS

# CURB RAMP AUDIT REPORT

*DEPARTMENT OF PUBLIC WORKS – ENGINEERING DIVISION*
*720 SOUTH FIFTH STREET, NASHVILLE, TENNESSEE 37206*

**PROJECT TYPE:** ☒ Sidewalk ☐ TDOT ☐ Utility ☐ Metro Paving ☐ Com/Res Development

**RAMP ID:** 3544 **CONTRACTOR:** RT GOODWIN

**STREET NAME/QUADRANT/CORNER:** N 17TH ST, NE CORNER

**SIDE OF STREET:** ☐ North ☐ South ☒ East ☐ West

**NEAREST CROSS STREET:** McEWEN AV

**MATERIAL:** ☒ Concrete ☐ Other _____ (***Explain in comments***)

**RAMP STANDARD:** ☒ ST-320 ☐ ST-321

**CONFORMS TO STANDARD:** ☒ Yes ☐ No (***If no, explain in comments***)

☐ Technically Infeasible ☐ Maximum extent feasible (***Explain in comments***)

**FLUSH MOUNT LIP AT CURB:** ☒ Less than 1/4 inch ☐ Greater than 1/4 inch ☐ Beveled

**OBSTRUCTONS:** ☒ None ☐ Pole ☐ Sign ☐ Fire plug ☐ Signal box ☐ Other_____
(If clearance less than 36" explain on reverse side)(Check all that apply)

**UTILITY BOX IN RAMP:** ☐ None ☒ Flush ☐ Greater than ½ in. (***Explain in comments***)

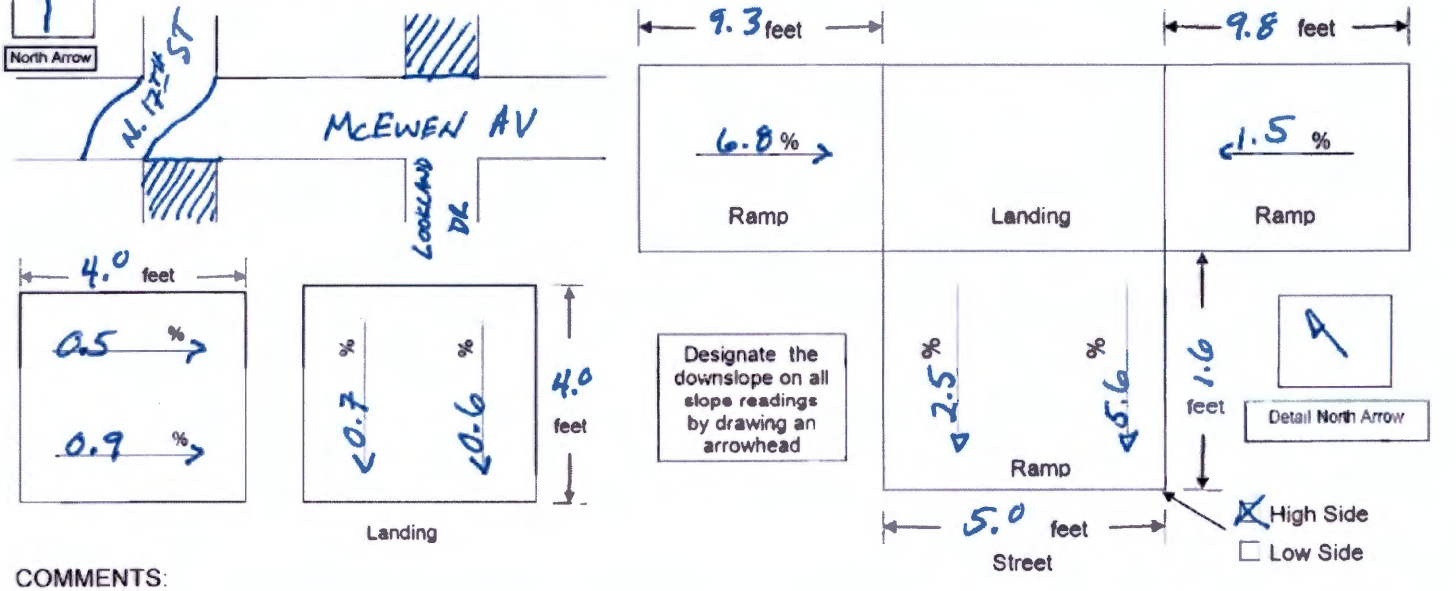
**DETECTABLE WARNINGS WIDTH OF RAMP X 24" & ALIGNED WITH DIR OF TRAVEL:** ☐ Yes ☒ No

**NOTE:** Add a comment to all aspects of curb ramp that are in non-conformance with Metro Standards.

**INSPECTION DATE:** 8-18-03 **INSPECTOR:** MANLOVE

**RE-INSPECTION DATE:** _____ **CONFORMS TO STANDARD:** ☐ Yes ☐ No
***(If no, explain in comments)***

4 Label Streets and mark location of ramp.




COMMENTS:

Rev. 03/30/2007

3544_AF1_NE CORNER OF N. 17TH ST. & MCEWEN ST.


3544_AF2_NE CORNER OF N. 17TH ST. & MCEWEN ST.

3544_AF3_NE CORNER OF N. 17TH ST. & MCEWEN ST.

# SIDEWALK AUDIT REPORT

*DEPARTMENT OF PUBLIC WORKS – ENGINEERING DIVISION*
*720 SOUTH FIFTH STREET, NASHVILLE, TN. 37206*

**PROJECT TYPE:** ☒ Sidewalk ☐ TDOT ☐ Utility ☐ Metro Paving ☐ Com/Residential Development

**SIDEWALK ID:** 1234 **CONTRACTOR:** R T GOODWIN

**STREET NAME:** SALEM MASON DEAD END → 26TH AV N

**SIDE OF STREET:** ☐ North ☐ South ☒ East ☐ West

**NEAREST CROSS STREET:** 26TH AV N

**MATERIAL:** ☒ Concrete ☐ Asphalt ☐ Brick ☐ Other _____

**SIDEWALK STANDARD:** ☐ ST-210 ☒ ST-211 ☐ Other _____

**CONFORMS TO STANDARD:** ☒ Yes ☐ No *(If no explain on reverse side)*

☐ Technically Infeasible ☐ Maximum extent feasible (***explain on reverse side***)

**WIDTH:** 4' **LENGTH:** 1136'

**CROSS SLOPE:** (front to back) ☐ 2% or less ☒ 2% - 3% ☐ 3% or greater

**RUNNING SLOPE OF SIDEWALK GENERALLY MATCHES GUTTER SLOPE?** ☒ Yes ☐ No

**OBSTRUCTIONS:** ☒ None ☐ Pole ☐ Sign ☐ Fire Plug ☐ Signal Box ☐ Other _____
(If clearance less than 36" explain on reverse side) (Check all that apply)

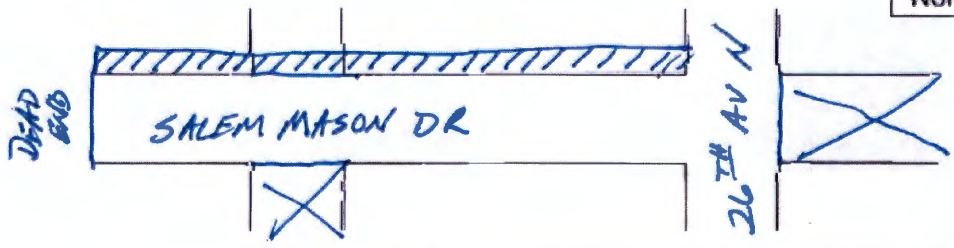
**UTILITY BOX IN RAMP:** ☒ None ☐ Flush ☐ Greater than ½ in. (Explain on reverse side)

**INSPECTION DATE:** 10-09-06 **INSPECTOR:** TROY D. HAYES

Label Streets and mark location of sidewalk.

4

North Arrow




*(Add additional information in accordance with the legend on reverse side of page.)*

Rev. 03/30/2007

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## Appendix 14.A – Example Field Authorization and Change Order Form

(This Section Reserved for future update.)

# Appendix 16.A – Example Release of Liens AIA Form G706A

# AIA® Document G706A™ – 1994

## *Contractor's Affidavit of Release of Liens*

| | | |
|---|---|---|
| **PROJECT:** *(Name and address)*<br>Division Street Extension from 8th Avenue South to 2nd Avenue South<br>Nashville, TN | **ARCHITECT'S PROJECT NUMBER:** | OWNER: ☐<br>ARCHITECT: ☐<br>CONTRACTOR: ☐ |
| | **CONTRACT FOR:** Division Street Extension | SURETY: ☐ |
| **TO OWNER:** *(Name and address)*<br>Metro Gov. of Nashville & Davidson County<br>P. O. Box 196301<br>Nashville, TN 37219-6301 | **CONTRACT DATED:** January 4, 2016 | OTHER: ☐ |

**STATE OF:** Tennessee
**COUNTY OF:** Davidson

The undersigned hereby certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

**EXCEPTIONS:**

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.

2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

**CONTRACTOR:** *(Name and address)*
Bell & Associates Construction, L.P.
P. O. Box 363
Brentwood, TN 37024

BY: _____
*(Signature of authorized representative)*
Steve Hoover, Project Executive
*(Printed name and title)*

Cynthia Maxwell State of Tennessee Notary Public Davidson County

Subscribed and sworn to before me on this date: 8/13/19

Cynthia Maxwell
Notary Public: Cynthia Maxwell
My Commission Expires: 11/8/21

# Appendix 16.B – Final Construction Report Instructions and Example

# 12A.1 FINAL CONSTRUCTION REPORT

This appendix contains guidelines and an example report to assist personnel in preparing final construction reports.

## 12A.1.1 FINAL REPORT GUIDELINES

### II. Project Description

A. **Project Identification.** Project number, project name, name of park, forest, Indian reservation, etc., route number, county, state, should all be included.

B. **Description of Work.** Should be described in brief narrative form. The various activities that went into the job should be included. The description of work in the contract should be referenced for guidance.

C. **Environmental Considerations.** Any extraordinary environmental considerations pertinent to the project should be described. All clearances and/or permits obtained for the project should be listed.

### III. Project Data

A. **Specifications.** The standard Federal or State specification that was the basis for project specifications should be included.

B. **Termini.** The beginning and ending of the project should be described in terms of stations and/or other significant and reasonably precise information. For National Park Service projects, the Road Inventory Program (RIP)/Bridge Program (BIP) Section(s) should be referenced.

C. **Length.** Mainline length is to be summarized. Incidental road lengths are to be shown separately.

D. **Width.** The predominant width of paved roadway and shoulders should be included. Any significant changes in the typical section stations should be noted.

E. **Pavement Structure.** The depth of wearing course, binder, base stone, etc., should be included.

F. **Structures.** The type, length, and location should be described. (BIP Section and structure number are to be referenced for NPS projects.)

G. **Contract Number and Date.** See Original contract.

H. **Contracting Officers.** Contracting Officer(s), and others involved in administering the contact and project should be listed; these include COE, CE, and DE.

I. **Contract Bid Amount.** Amount from original contract.

J. **Engineer's Estimate.** Amount from the original Engineer's Estimate.

K. **Final Contract Amount.** Amount from the Final Progress Payment Report.

L. **Contract Time.** Any significant dates should be shown. These include the award date, date of notice to proceed, original completion date, authorized extended completion date, date of substantial completion, date of actual completion, and date of final acceptance. Any periods of liquidated damages, special periods for plant establishment, stream work restrictions, etc. should be summarized.

M. **Contractor.** The contractor's name, address, and category (i.e., small business, DBE, etc.) should be shown.

N. **Subcontractors.** All first tier and large second tier subcontractors' names should be listed along with a description of the work each was involved in. The category of each (i.e., small business, DBE, WBE, etc.) should be shown, along with the original or reported amount of each subcontract. If the prime contract required a subcontracting plan, the comparison of goals with levels achieved should be shown.

O. **Construction Engineering Costs.** The total FLH costs, including contract inspection costs should be shown. These costs as a percentage of the final contract amount (construction costs) should be computed and shown. [(CE+ CI) x 100/contract amount] (As Partner agencies require, Divisions may report Preliminary Engineering and Construction Engineering costs together under this section.)

P. **Maintaining Agency.** The agency responsible for maintenance of the road the project is on should be identified.

## IV. Construction

A. **Materials.** Sources of significant raw materials and manufactured items and their quality indicators are to be listed (e.g., for aggregates: include type, wear, soundness, specific gravities; for bituminous mixes: include grading used, densities, average asphalt content; etc.). Manufacturers, suppliers, and fabricators of significant structural items and assemblies are to be listed. Problems encountered in materials control, if significant, should be described. Quantities of recycled materials incorporated in the work should be shown. The pay factor for any item where it was other than 1.0 (100%) should be indicated.

B. **Experimental or New Features.** Any significant experimental, demonstration, new, innovative, or unusual features, methods, and/or materials should be described. A separate report may be referenced, if one is available, or being written. Funding of special work, if separate from basic contract funds, should be explained.

C. **Changes & Problems.** Contract modifications, with a brief description of each, are to be listed. The amount of each and any associated time change are to be described.

Problems encountered, including delays, *unusual* weather, traffic control, design and construction changes, and errors, are to be discussed. Be constructive, factual, and identify personal opinions when they are used.

A general description of *significant* plan versus field differences should be written. Any overrun or underrun items of 15 percent or more should be explained.

Conditions encountered that might *significantly* and adversely affect future maintenance, design, or construction are to be described.

D. **Recommendations.** Based on experience from the project, any recommendations for future design, construction, and maintenance should be made. Staff specialists, such as the Bridge Design Engineer, Geotech Engineer, etc., should be consulted in advance of making recommendations that relate to their work. It should be kept in mind that the report may be distributed widely.

E. **Claims.** Each claim with a brief description and status or disposition should be listed. "No known claims" should be indicated if such is the case. If a claim is in litigation, a note should be attached reminding the COE to clear the report through the Regional Counsel prior to its being finished.

The resolution of significant disagreements that did not become formal claims should be described. Any pertinent supplemental agreements should be referenced.

## V. Construction Engineering

A. **Project Personnel.** Names (not grades) of Project Engineer and major staff should be listed. Inclusive dates if there has been more than one Project Engineer should be shown.

B. **Contract Inspection.** If contract inspection services were used, describe the character of these service (e.g., number of personnel, assignment durations, nature of inspection duties, etc.).

C. **Other Contacts.** Name(s) and title(s) of cooperating agency personnel directly involved with the project, and other individuals who have impacted the work or its time for completion should be listed.

D. **Partnering.** If the project was partnered, the process should be summarized, along with the principal participants. Overall results should be described.

## VI. Appendix

A. **Title Sheet, Location Map and Typical Sections.** As-built sections (include bridge sections and layouts) should be included.

B. **Tabulation of Bids.**

C. **Final Voucher Assembly.** See Section 12.7.8

D. **Project Materials Certification.** See FLH Field Materials Manual.

E. **Project Photographs.** Before and after pictures should be included. These should not be repetitious (e.g., shot after shot of a completed paving project). Critical stages of major operations should be shown (e.g. excavation and embankment operations, including benching, structure foundation, and falsework in place – anything which would be useful at a later date should a slide, structural, or other failure occur). Views of new or experimental features or equipment should be shown. The report should not be loaded with pictures showing the same thing, or standard, or insignificant operations. At a minimum, a date and caption should be included.

F. **Special Reports.** If appropriate, copies of reports on special or experimental features incorporated into the project should be included.

## 12A.1.2 SAMPLE FINAL REPORT

*EXAMPLE*

**FINAL CONSTRUCTION REPORT**

**Project NASA 1(2)**
**Goddard Space Flight Center**

### I. PROJECT DESCRIPTION

A. **Project Number –** Project NASA 1(2) was located in Greenbelt, MD, in Prince Georges County.

B. **Description of Work –** This project consisted of the rehabilitation of the roadway and bridge that connected the Goddard Space Flight Center (GSFC) complex, of the National Aeronautics and Space Administration (NASA), with the Baltimore Washington Parkway. Only the ramps that provided connection to the northbound lanes of the Parkway were included in this project.

The work included removal and replacement of bridge superstructure; cleaning and painting of the structural steel girders; shotcrete repairs of the substructure; 1-½ inch asphalt pavement overlay of the access road and ramps; replacement of concrete medians and guardrails; shoulder work; new signs and pavement marking; and other miscellaneous work.

Schedule A consisted of all the bridge, concrete approach, and roadway work between 67 meters from the end of western approach slab and 58 meters from the eastern approach slab.

Schedule B consisted of completing the roadway work along the GSFC's access road from both end of the Schedule A work, and also consisted of the roadway work along the ramps to and from northbound Baltimore Washington Parkway.

Both schedules were awarded.

C. **Environmental Considerations –** GSFC prepared an Environmental Record Of Consideration, dated March 1, 1996, in accordance with NHB8800.11 and CFR 1500 guidance, and with a determination of categorical environmental exclusion. The Maryland Historical Trust issued a letter, dated July 16, 1995, stating that the proposed work will not have an adverse effect on eligible historic properties, structures, and archeological sites, or significantly alter the appearance of the structure. The National Park Service (NPS) issued a Special Use Permit to GSFC, signed by the Center Director on October 21, 2002, which was also checked as having a National Environmental Protection Agency Compliance of categorically excluded.

## II. PROJECT DATA

A. **Specifications –** Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, FP-96 (Metric).

B. **Termini –**

| | |
|---|---|
| NASA Access Road: | Construction began at 426 meters from the east end of the bridge deck, and continued west to the limit of work at the fork for the ramps to and from the southbound lanes of the Parkway. |
| Ramp from northbound Parkway: | Between the Access Road and the limit of work at 171 meters along the ramp. |
| Ramp to northbound Parkway: | Between the Access Road and the limit of work, at 242 meters along the ramp. |

C. **Length –**

| | |
|---|---|
| NASA Access Road | 0.742 kilometers (km) |
| Ramp from northbound Parkway | 0.171 km |
| Ramp from southbound Parkway | 0.242 km |
| Total length | 1.155 km |

D. **Width –**

Access Road: From the GSFC gate to the northbound parkway ramps – four 6.71-meter lanes (2-each way), plus widening, with a 1.22-meter concrete median and 2.74-meter shoulders. Thereafter, two 4.88-meter lanes (1-each way), with a 1.22-meter concrete median and variable shoulders.

Bridge Approaches: 11.5 meters of clear roadway, with 4.88-meter travel lanes (1 each way).

Ramps: Single 4.88-meter lane, with 1.83 to 2.74 meter-shoulders.

E. **Pavement Structure –**

The existing asphalt pavement of the NASA Access Road and the ramps, to and from the Baltimore Washington Parkway, were overlaid with 40 millimeters (mm) of 12.5-mm Superpave hot asphalt concrete pavement. The paved shoulder section was constructed of 130-mm of 19.0-mm Superpave hot asphalt concrete pavement and 40-mm of 12.5-mm Superpave hot asphalt concrete pavement.

F. **Structures –**

The bridge is a six span steel girder bridge over the Baltimore Washington Parkway, along the access road to the GSFC.

Bridge Inspection Program Number: 2170-001P

Length: 117.544 meters back to back of backwalls.

Width: 12.7 meters wide concrete deck, with 11.5 meters of clear roadway. There are two 4.88 meter travel lane on the bridge (1-each way).

G. **Contract Number and Date –**

DTFH71-03-C-00018 – January 18, 2003

H. **Contracting Officers –**

| | |
|---|---|
| Melisa L. Ridenour, | Division Engineer |
| Donald W. Miller, | Director, Project Delivery |
| Wanda A. Peffer, | Contracting Officer |
| Eduardo A. Calderon, | Construction Engineer |
| Douglas E. Nair, | Construction Operation Engineer |

I. **Contract Bid Amount –** $1,998,026.00 Schedule A
$335,583.00 Schedule B

J. **Engineer's Estimate –** $1,960,000.00 Schedule A
$310,000.00 Schedule B

K. **Final Contract Amount –** $2,353,798.89

L. **Contract Time –**

| | |
|---|---|
| Award Date: | January 18, 2003 |
| Notice to Proceed: | February 28, 2003 |
| Original Completion date: | June 16, 2004 |
| Authorized Extension Granted: | 117 Days |
| Revised Completion Date: | October 11, 2004 |
| Date Substantially Complete: | July 09, 2004 |
| Date All Work Complete: | October 12, 2004 |
| Liquidated Damages Accessed: | None |

M. **Contractor –**

Martins Construction Corporation Small Business Concern (SBC)
6950 North Fairfax Drive
Arlington, Virginia 22213

N. **Subcontractors –**

A. Annandale, Inc. SBC
P.O. Box 249
Dumfries, VA 22026
*Permanent Pavement Markings* $16,684.50

| | | |
|---|---|---|
| Arthur Construction Company<br>2847 Cherry Branch Lane<br>(WBE)<br>Herndon, VA 20171<br>*Shoulder Reconditioning* | Disadvantage Business Enterprise (DBE)<br>Woman Owned Business Enterprise | $86,904.00 |
| Central Atlantic Contracting Company<br>1550 S. Philadelphia Road<br>Aberdeen, MD 21001<br>*Groove Bridge Deck* | | $44,000.00 |
| DBA HM Welding<br>1751 Henrique Street<br>Falls Church, VA 22043<br>*Welding* | SBC | $6,000.00 |
| Prince Construction Co. Inc.<br>1111 Good Hope Road SE.<br>Washington, DC. 20020<br>*Install Bridge Reinforcing Steel* | DBE | $36,606.80 |
| DMR Associates, Inc.<br>4334 Hanover Pike<br>Manchester, MD 21102<br>*Weld Expansion Dams* | | $21,390.00 |
| Guardrails Etc, Inc.<br>4010 North Point Boulevard<br>Baltimore, MD 21222<br>*Timber Guardrail* | DBE - WBE (Section 8) | $190,905.25 |
| Locust Lane Farms Inc.<br>3202 Locust Way<br>Mitchellville, MD 20716<br>*Turf Establishment* | SBC | $625.00 |
| Paint City Contractors, Inc.<br>4054 North Point Boulevard<br>Baltimore, MD 21222<br>*Bridge Painting* | SBC | $370,000.00 |
| The Lane Construction Corporation<br>Senate Asphalt Division<br>P.O. Box 71080, SW Station<br>Washington, DC. 20024<br>*Asphalt Paving* | | $79,155.00 |
| Safety Grooving & Grinding, LP<br>Central Atlantic Contracting Company<br>1550 South Philadelphia Blvd.<br>Aberdeen, MD 21001 | | |

*Bridge Deck Grooving* $3,780.00

The Marksmen Company SBC
P.O. Box 239
Centreville, MD 21617
*Shotcrete Repairs* $89,280.00

O. **Construction Engineering Costs –**

| | |
|---|---|
| EFLHD PE Costs: | $322,952.00 |
| EFLHD CE Costs: | $140,000.00 |
| CI Costs: | $152,908.00 |
| Total Costs: | $615,860.00 |

Percent of the Final Contract Amount – 26.16

P. **Maintaining Agency –**

Goddard Space Flight Center/National Aeronautics and Space Administration

## III. CONSTRUCTION

A. **Materials –**

**Item No. 30101E:** Aggregate Base, Grading E, and

**Item No. 30101Z:** Aggregate Base, Grading C or D ((MD-DOT Grading GAB Option)

Supplier: Aggregate Industries, PLC – Bladensburg Terminal
6401 Golden Triangle Drive
Greenbelt, MD 20770

Material: Crushed Aggregate – Millville Quarry, Maryland

Approved Job Mix Design:

| Sieves | Target Value (Percent Passing) | Allowable Deviation (Percent) | Specification (Percent Passing) |
|---|---|---|---|
| 50.0 mm | 100 | - | 100 |
| 37.5 mm | 100 | 5 | 95-100 |
| 19.0 mm | 86 | 6 | 79-92 |
| 9.5 mm | 65 | 7 | 58-72 |
| 4.75 mm | 47 | 6 | 41-55 |
| 600 µm | 18 | 4 | 14-22 |
| 75 µm | 8.0 | 3.0 | 5.0-11.0 |

| | |
|---|---|
| Maximum Dry Density: | 147.6 pounds per cubic foot (pcf) |
| Optimum Moisture Content: | 5.7 percent |
| Bulk Specific Gravity (Sp/Gr): | 2.83 |
| Sodium Sulfate Soundness: | 0.7 percent |
| LA Abrasion: | 22 percent wear |
| Fractured Faces: | 100 percent |
| Liquid Limit: | 21 |
| Plasticity Index: | Non-plastic |
| California Bearing Ratio: | 185 percent |

Pay Factor: *(provide only if other than 1.0)*

**Item No. 41801BAD:** Superpave Asphalt Concrete Pavement, 12.5 mm Nominal Maximum Size Aggregate, < 0.3 ESAL, Type 4 Pavement Smoothness

Supplier: LarFarge North America, Inc. – Branchville Plant No. 3
10000 Beaver Dam Road
Cockeyville, MD 21030

Aggregates:

Frederick #7 — 15 percent
LaFarge North America, Inc.
Frederick, MD

Bulk Sp/Gr: 2.076
Apparent Sp/Gr: 2.736
Absorption: 0.4 percent
LA Abrasion: 22 percent
Sodium Sulfate Soundness: 1.8 percent

Churchville Birdeye — 30 percent
LaFarge North American, Inc.
Churchville, MD

Bulk Sp/Gr: 2.978
Apparent Sp/Gr: 3.070
Absorption: 0.5 percent
LA Abrasion: 20 percent
Sodium Sulfate Soundness: 0.2 percent

Frederick Washed No.10 — 35 percent
LaFarge North America, Inc.
Frederick, MD

Bulk Sp/Gr: 2.663
Apparent Sp/Gr: 2.728
Absorption: 0.9%
Sodium Sulfate Soundness: 0.7%

Frederick Dry No. 10 — 20 percent
LaFarge North American, Inc.

Frederick, MD

Bulk Sp/Gr: 2.586
Apparent Sp/Gr: 2.738
Absorption: 2.10%
Sodium sulfate Soundness: 0.7%

Asphalt Binder Grade and Source: PG 64-22
Valero Energy Corporation
Baltimore, MD

Antistripping Additive: None required

Job Mix Design Properties:

| Sieves | Target Value (Percent Passing) | Allowable Deviation (Percent) | Specification (Percent Passing) |
|---|---|---|---|
| 19.0 mm | 100 | - | 100 |
| 12.5 mm | 98 | - | 90-100 |
| 9.5 mm | 91 | 6 | 85-97 |
| 4.75 mm | 64 | 6 | 58-70 |
| 2.36 mm | 38 | 6 | 32-44 |
| 1.18 mm | 23 | - | - |
| 600 µm | 14 | 4 | 10-18 |
| 300 µm | 10 | 3 | 7-13 |
| 150 µm | 8 | - | - |
| 75 µm | 5.8 | 2.0 | 3.8-7.8 |

Asphalt Content – 5.3 (± 0.5) percent of total mix
Maximum Theoretical Specific Gravity: 2.553
Dust/Asphalt Ratio: 1.09
Voids in Mineral Aggregate (VMA): 17.2 percent
Voids Filled with Asphalt (VFA): 65.0 percent

Pay Factor: *(provide only if other than 1.0)*

**Item No. 41801CA:** Superpave Asphalt Concrete Pavement, 19.0 mm Nominal Maximum Size Aggregate, <0.3 ESAL,

Supplier: LarFarge North America, Inc. – Branchville Plant No. 3
1000 Beaver Dam Road
Cockeyville, MD 21030

Aggregates: Frederick No. 57 35 percent
LaFarge North America, Inc.
Frederick, MD

Bulk Sp/Gr: 2.712
Apparent Sp/Gr: 2.742

Absorption: 0.4 percent
LA: Abrasion: 22 percent
Sodium Sulfate Soundness: 1.8 percent

Churchville Birdeye 30 percent
LaFarge North America
Churchville, MD

Bulk Sp/Gr: 2.987
Apparent Sp/Gr: 3.070
Absorption: 0.5 percent
LA Abrasion: 20 percent
Sodium Sulfate Soundness: 0.2 percent

Frederick No.10 15 percent
LaFarge North American, Inc.
Frederick, MD
Bulk Sp/Gr: 2.586
Apparent Sp/Gr: 2.738
Absorption: 2.10 percent
Sodium sulfate Soundness: 0.7 percent
Sand Equivalent: 86

Frederick Washed No.10 10 percent
LaFarge North American, Inc.
Frederick, MD

Bulk Sp/Gr: 2.663
Apparent Sp/Gr: 2.728
Absorption: 0.9 percent
Sodium Sulfate Soundness: 0.7 percent
Sand Equivalent: 92

York Sand (Belvedere) 10 percent
York Building Products
Perryville, MD

Bulk Sp/Gr: 2.570
Apparent Specific Gravity: 2.610
Absorption: 0.8 percent
Sodium Soundness: 1.8 percent
Sand Equivalent: 60

Asphalt Binder Grade and Source: PG 64-22
Valero Energy Corporation
Baltimore, MD

Antistripping Additive: None required

Job Mix Design Properties:

| Sieves | Target Value (Percent Passing) | Allowable Deviation (Percent) | Specification (Percent Passing) |
|---|---|---|---|
| 25.0 mm | 100 | - | 100 |
| 19.0 mm | 95 | - | 90-100 |
| 12.5 mm | 79 | 6 | 73-85 |
| 9.50 mm | 69 | 6 | 63-75 |
| 4.75 mm | 46 | 6 | 40-52 |
| 2.36 mm | 28 | 6 | 22-34 |
| 1.18 mm | 19 | - | - |
| 600 µm | 13 | 4 | 9-17 |
| 300 µm | 9.0 | 3 | 6-12 |
| 150 µm | 6.0 | - | - |
| 75 µm | 5.2 | 2.0 | 3.2-7.2 |

Asphalt Content – 4.3 (± 0.5) percent of total mix
Maximum Theoretical Specific Gravity: 2.595
Dust/Asphalt Ratio: 1.21
VMA: 14.3 percent
VFA: 63.5 percent

Pay Factor: *(provide only if other than 1.0)*

Used 40 tons of base asphalt. No tests were performed and no cores were taken. Acceptance based on Suppliers approved mix design.

**Item 55202DC:** Structural Concrete, Class D (AE), for Substructure (bridge abutments)
**Item 55207DN:** Structural Concrete, Class D (AE), for Approach Slabs, Type 1
**Item55210B:** Repair Concrete
And
**Item No. 61601:** Concrete Slope Paving

Class of Concrete: D (AE)

Supplier: Aggregate Industries-Mid Atlantic – Crofton Plant
6401 Golden Triangle Drive – Suite 400
Greenbelt, MD 20770

Mix Requirements: Minimum Strength – 4000 pounds per square inch (psi) in 28 days
Minimum Cement Content – 607 pounds per cubic yard (pcy)
Maximum Water/Cement Ratio – 0.40
Maximum Slump – 4.0 or 8.0 inches (with Sikament 2000)
Minimum Air Content – 5.0 percent

| | | |
|---|---|---|
| Portland Cement: | AASHTO M85, Type I/II<br>LaFarge North American<br>5700 Chemical Road<br>Baltimore, MD 21226-0746 | 488 pcy |
| Slag Cement: | NewCem Brand<br>(AASHTO M-302, Grade 120)<br>LaFarge North American<br>Sparrow Point Plant<br>2001 Wharf Road<br>Baltimore, MD 21219 | 162 pcy |
| Fine Aggregate: | Natural Sand<br>(AASHTO M-6, Class A)<br>Aggregate Industries<br>Brandywine Plant<br>Brandywine, MD<br><br>Clay lumps and/or<br>friable particles – 0.2 percent<br>Coal and lignite – 0.02 percent<br>Organic impurities – Plate 1<br>Passing 75 µm sieve – 0.9 percent<br>Sand Equivalent Value: *(provide if available)*<br>Fineness Modulus – 2.64<br>Bulk Sp/Gr at<br>Saturated Surface Dry (SSD) – 2.63<br>Sodium Sulfate Soundness – 0.8 percent<br>Absorption – 0.5 percent | 1317 pcy |
| Course Aggregate: | No. 57 Dolomite Limestone<br>(AASHTO M-80, Class A)<br>Aggregate Industries<br>Bladensburg Terminal<br><br>Clay lumps and/or<br>friable particles – 0.2 percent<br>Coal and lignite – 0.0 percent<br>SSD Bulk Sp/Gr – 2.83<br>LA Abrasion, grading B – 15 percent<br>Sodium Sulfate Soundness – 1.2 percent<br>Adherent Coating: *(provide if available)* | 1800 pcy |
| Water: | Potable (city water main) | 254 pcy |

Fly Ash: *(provide if used)*

| | | |
|---|---|---|
| Air Entrainment: | Slika AEA-14<br>(AASHTO M-154)<br>Slika Corporation<br>201 Politic Avenue<br>Lyndhurst, NJ 07071 | 3.3 ounces per cubic yard |
| Water Reducer:<br>(High Range) | Sikament 2000<br>(AASHTO M-194, Types A and F)<br>Slika Corporation<br>201 Politic Avenue<br>Lyndhurst, NJ 07071 | 42.2 ounces per cubic yard |

Average Test Results: Slump = 3.75 inches

Air content = 5.8 percent
Temperature = 79º F
28-day cylinder breaks = 4910 psi

Pay Factor: *(provide only if other than 1.0)*

Approach Slabs Reinforcing Steel: Epoxy Coated (Same as Item 55402)

Slope Paving Reinforcement: W2.9/W2.9, 6 gage, 6-inch x 6-inch, steel wire mash, from Ivy Steel & Wire Company

Supplier: National Capital Industries
P.O. Box 287
Bladensburg, MD 20170

**Item No.55202DE:** Structural Concrete Class D (AE) For Bridge Deck (lightweight); and

**Item No. 55207DK:** Structural Concrete Class D (AE) For Parapets (lightweight)

Class of Concrete: D (AE)

Supplier: Aggregate Industries-Mid Atlantic – Crofton Plant
6401 Golden Triangle Drive – Suite 400
Greenbelt, MD 20770

Mix Requirements: Minimum Strength – 4000 psi in 28 days
Minimum Cement Content – 607 pcy
Maximum Water/Cement Ratio – 0.44
Maximum Slump – 4.0 or 8.0 inches (with Sikament 2000)
Minimum Air Content – 5.0 percent

| | | |
|---|---|---|
| Portland Cement: | AASHTO M85, Type I/II<br>*(Same as Item 55202DC)* | 488 pcy |
| Slag Cement: | NewCem Brand<br>*(Same as Item 55202DC)* | 162 pcy |
| Fine Aggregate: | Natural Sand<br>*(Same as Item 55202DC)* | 1301 pcy |
| Course Aggregate: (Lightweight) | Carolina Solite – Aquadale, NC Plant<br>(AASHTO M-195)<br>Solite Corporation<br>P.O. Box K 28<br>Richmond, VA 23228<br><br>Organic impurities (color) – No change<br>Clay Lumps – 0.0 percent<br>Loss of ignition – 0.12 percent<br>Pop outs – None<br>Shrinkage at 28-days – 0.034 percent<br>Stain test – No stain<br>Unit Weight (dry loose) – 47.0 pcf<br>SSD Bulk Sp/Gr – 1.46<br>Absorption – 5.4 percent | 875 pcy |
| Water: | Potable (city water main) | 288 pcy |
| Air Entrainment: | Slika AEA-14<br>*(Same as Item 55202DC)* | 3.3 ounces per cubic yard |
| Water Reducer: | Plastocrete 162<br>(AASHTO M-194, Type A<br>Slika Corporation<br>201 Politic Avenue<br>Lyndhurst, NJ 07071 | 26.0 ounces per cubic yard |
| Water Reducer: (High Range) | Sikament 2000<br>(AASHTO M-194, Types A and F)<br>Slika Corporation<br>*(Same as above)* | 42.2 ounces per cubic yard |

Average Test Results:
Slump = 3.9 inches
Air content = 5.8 percent
Temperature = 79º F
28-day cylinder breaks = 4980 psi

Pay Factor: *(provide only if other than 1.0)*

**Item No. 55212A:** Concrete Color Finish

Material:
- Primer: FX-460 Primer
- Surface: FX-460 Breathable Masonry Coating
  Color No. 25630 of Federal Standard 595B Colors

Supplier: Fox Industries, Inc.
3100 Falls Cliff Road
Baltimore, MD 21211

**Item No. 55402:** Epoxy Coated Reinforcing Steel

Type: AASHTO M-31, Grade 60

Coating: Scotchkote 413
3M, Inc.
New Ulm, MN
**Or**
720A009 Greenbar Fusion Bond Epoxy Powder Coating
Valspar Corporation
Charlotte, NC

Supplier: Gerdau Ameristeel

Fabrication Plant: York Reinforcing Steel
York, PA

**Item No. 55502:** Bridge Expansion Joints

Supplier: Eddy's Welding Inc.

Fabrication Plant: Ellicott City, MD

Joint Seal: Delastic E-3000
D.S. Brown Company
North Baltimore, OH

**Item No. 55601CA:** Aluminum Bridge Rail
(Conforms to FP-96, Table 717-3)

Supplier: L.B. Foster Company

Fabrication Plant: Pittsburgh, PA

**Item No. 56303A:** Bridge Paint System

Surface Preparation: Society for Protective Coatings Specification – SSPC-SP 5, white metal blast cleaning; using steel grit (with recycling equipment).

Paint System: FP-96, Table 563-1 – System Number 1

Supplier: Finnaren and Haley Paint & Coatings, Inc.
901 Washington Street
Conshohocken, PA 19428

Primer: Indurazine FB Zink (Inorganic) 15216/151195
Intermediate: Indulon 824 MIL-DTL-2441B, Type IV Primer White 824100/824801
Surface: Indurathane 890 Acrylic Urethane 890000/890800
Color No. 36306, of Federal Standard 595B Colors

**Item No. 56601F:** Shotcrete, 50 mm Depth (Item not used)

**Item No. 56601K:** Shotcrete, 100 mm Depth (reinforced)

Subcontractor: The Marksmen Company

Material: Bay Bridge Shotcrete Low Rebound (with fibers)
American Stone Mix, Inc.
8320 Bellona Avenue
Towson, MD 21204-2086

Mix Requirements: Minimum Strength – 3200 psi at 7 days
5370 psi at 28 days

Mix Design: Strength – 4000 psi at 3 days and 8000 psi at 28 days
Water/Mix Ratio – 0.1 maximum

Average Test Results: 4700 psi at 2 days and 5560 psi at 7 days

Reinforcement wire: (Same as Item 61601)

**Item No. 61503B:** Portland Cement Concrete Median

Class of Concrete: A (AE)

Supplier: Aggregate Industries-Mid Atlantic – Crofton Plant
6401 Golden Triangle Drive – Suite 400
Greenbelt, MD 20770

Mix Requirements: Minimum Strength – 3000 psi in 28 days
Minimum Cement Content – 611 pcy
Maximum Water/Cement Ratio – 0.49
Maximum Slump – 4.0 inches
Minimum Air Content – 4.0 percent

Portland Cement: AASHTO M85, Type I/II 458 pcy
*(Same as Item 55202DC)*

| | | |
|---|---|---|
| Slag Cement: | NewCem Brand<br>*(Same as Item 55202DC)* | 153 pcy |
| Fine Aggregate: | Natural Sand<br>*(Same as Item 55202DC)* | 1295 pcy |
| Course Aggregate: | No. 57 Dolomite Limestone<br>*(Same as Item 55202DC)* | 1800 pcy |
| Water: | Potable (city water main) | 288 pcy |
| Air Entrainment: | Slika AEA-14<br>*(Same as Item 55202DC)* | 3.3 ounces per cubic yard |
| Water Reducer: | Plastocrete 162<br>*(Same as Item 55202DE)* | 26.0 ounces per cubic yard |

Average Test Results: Slump = 4.1 inches
Air content = Not determined
Temperature = 81º F
7-day cylinder breaks = 2770 psi

**Item No. 61701G:** Guardrail System SBTA

Subcontractor: Guardrails Etc., Inc.

Material:
Chromated Copper Arsenate treated Southern Pine lumber (AASHTO M-168)
G.E. Frisco Company
Upper Marlboro, MD

0.375-inch, corrosion resistant, steel backing elements and hardware
Wilton Corporation
Flinksburg, MD

B. **Experimental or New Features –**

None.

C. **Changes & Problems –**

1. Changes

Contract Modification (CM) No. 0001 was an unilateral administrative CM issued to correct an error found on line 21 of the Standard Form 1442 Solicitation, Offer and Award dated November 4, 2002, for this contract. This CM changed the calendar days for the contract completion from issuance of Notice to Proceed included on line 21 from 534 calendar days to 475 calendar days.

There was no change in contract amount, or the time that was part of the Contractor's bid.

CM No. 0002 was issued to allow for the combining of construction Stages III and IV, and the total closure of the bridge to traffic during Stages III and IV. As a result, a new pay item was created to give the government a credit of $10,216.56, and the pay item for moving temporary concrete barriers was deleted, as it was no longer needed.

The items for selective cleaning, removal of signs, and 50 mm shotcrete were deleted due to actual field conditions being different than anticipated. Also, the estimated quantities of various other items were adjusted because of existing field conditions being different than originally anticipated, the combining of Stages III and IV, or the government's decision to exercise the option to add Schedule B to the contract, which is addressed in CM 0003 below.

Net contract increase = $43,486.60 No change in contract time.

CM No. 0003: The Government exercised the option by adding the performance of Schedule B to the contract.

Due to the delay of the government in issuing this CM, an additional 15 calendar days were added to the time bid by the contractor for Schedule B. The contract completion date was changed from June 16, 2004 to July 31, 2004.

Net contract increase = $335,583.00 Contract time increase = 45 calendar days.

CM No. 0004: CM 0003 contained an exception that allowed for a future extension of contract time for guardrail work. Because of the delay in issuing CM 0003, the contractor required an extensive amount of additional time in order to obtain enough material for the steel backing timber guardrail that was beyond their control. Therefore, the contract completion date was changed from June 16, 2004, to October 11, 2004.

No change in contract amount. Contract time increase = 72 calendar days.

CM No. 0005 issued a credit to the Contractor for the unused lane rental days, as specified in the contract, for 27 days at $400.00 per day. A new pay item was created to pay the contractor the $10,800.00 amount of this credit.

At the request of NASA, a new pay item was established for rumble strips to be placed prior to the entrance to the GSFC compound. Also, the final quantities of 35-pay items were adjusted due to changes made and existing field conditions being different than originally anticipated.

Net contract decrease = ($23,296.71) No change in contract time.

Significant Overruns and Underruns

Schedule A

Item 20303AC: Removal of Concrete Slope paving underran by 17.1 percent due adjustments made to match existing field conditions.

Item 20303AEB: Removal of Portland Cement Concrete Median overran by 90.6 percent because part of Schedule B quantity needed to be removed during Schedule A operations.

Item 20307: Sawcutting Pavement underran by 57.7 percent by combining Stages 3 and 4 of Schedule A.

Item 20401: Roadway Excavation underran by 100 percent; this work was performed during Schedule B operations.

Item 20803: Structural Backfill underran by 44 percent, due to actual field measurements as compared to estimated quantities.

Item30101Z: Aggregate Base, Grading C or D overran by 97 percent; this quantity was underestimated.

Item 30306A: Shoulder Reconditioning underran by 50 percent due to variations in actual field measurements as compared to estimated quantities.

Item 41801BAD: Superpave Asphalt Concrete Pavement, 12.5mm underran by 77.7 percent due to performing the majority of the work during Schedule B operations.

Item 41801CA: Superpave Asphalt Concrete Pavement, 19.0mm overran by 128 percent due to part of Schedule B work being done during Schedule A operations..

Item 55210: Repair Concrete underran by 18.2 percent due to existing field conditions being different than anticipated.

Item 56601F: 50mm Shotcrete underran – This item deleted due to existing field conditions being worse than anticipated. (See Item 55601K below.)

Item 55601K: 100mm Shotcrete overran by 560 percent due actual field conditions; repairs were more extensive than was anticipated.

Item 56101: Structural Concrete Bonding underran by 95 percent due to the increased depth of the shotcrete repairs.

Item 61503B: Portland Cement Concrete Median underran by 100 percent; the work was performed during Schedule B operations.

Item 61601: Concrete Slope Paving underran by 17.1 percent due to actual field conditions warranted a smaller quantity be removed.

All traffic control items, 63503A through 63526, had quantities different than those originally estimated, which was caused by the combining of Stages III and IV under CM 0002.

Schedule B

Item 20302RB: Removal of Portland Cement Concrete Curb underran by 50.5 percent due to NASA's decision to leave some of the existing curb in place.

Item 20401: Roadway Excavation underran by 63 percent because an existing paved shoulder was utilized in the construction of the turnaround area.

Item 30101E: Aggregate Base, grading E overran by 94 percent due the existing shoulders being lower than shown on the typical plan sheets.

Item 30306A: Shoulder Reconditioning underran by 49.5 percent due actual field conditions being different than anticipated.

Item 41801BAD: Superpave Asphalt Concrete Pavement 12.5mm overran by 20 percent. Due to existing field conditions, this item was also used as a wedge and level course prior to placing the surface course.

Item 41801CA: Superpave Asphalt Concrete Pavement 19.0mm underran by 68 percent due to the utilization of the existing paved shoulder when constructing the turnaround area.

Item 62403: Furnishing and Placing Topsoil underran by 38.3 percent due to adjustments made to match existing field conditions.

Item 62509: Turf Establishment overran by 200 percent due to adjustments made to match existing field conditions.

Item 63401BA: Pavement Markings, type B, solid overran 52.0 percent due to variations in actual field measurements as compared to estimated quantities.

2. Problems

The gate to the complex was damaged several times by incoming traffic. To help alleviate this problem, thermoplastic rumble strips were added to the eastbound NASA Access Road, at the request of GSFC, to warn motorist of the gate ahead.

D. **Recommendations –**

None.

E. **Claims –** None.

## IV. CONSTRUCTION ENGINEERING

A. **Project Personnel –**

Martin German, Project Engineer/COTR

B. **Contract Inspection –**

Ben Rent, KCI Technologies, Level 3 inspector. His primary duties were onsite of inspection of bridge and roadway construction.

C. **Other Contacts –**

Goddard Space Flight Center:
Tim Regan, Project Manager

National Park Service:
Charles Borders, Project Manager

D. **Partnering –**

Informal partnering was successfully implemented on this project, and a good relationship was maintained between all shareholders.