Task Order No.*insert number*

STIP Project*insert number*

Scope of Work –*insert date prepared*

Prepared by: *insert name of preparer & name of firm*

**Final Design Traffic Noise Analysis**

The CONSULTANT will prepare a Final Design Traffic Noise Analysis for STIP Project \_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_\_ County. The project includes \_\_\_\_\_(detailed description including route, termini, length, etc.) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The Final Design Traffic Noise Analysis will be prepared in accordance with 23 CFR 772, the 2016 NCDOT Traffic Noise Policy and the 2016 NCDOT Traffic Noise Manual. A \_\_\_\_\_\_\_\_\_ (NEPA\SEPA environmental document type) is / was being prepared for this project. *(if the environmental document has been approved, provide the approval date and state that this is the Date of Public Knowledge.* Federal funding will / will not be utilized.

**1. Obtain Existing Project Information and Coordinate with NCDOT**

The CONSULTANT’s traffic noise staff will review existing project information provided by NCDOT to gain a perspective of the noise sensitive land uses and potential noise impacts in the vicinity of the project.

**1.A. Project Area Reconnaissance and Land Use**

The CONSULTANT will review the data requirements necessary to perform the traffic noise analysis (Section 8.5 of the Traffic Noise Manual) to determine if a Project Area Reconnaissance will be needed. If a Project Area Reconnaissance is necessary, the CONSULTANT will complete a field visit to obtain the necessary data before preparing the Noise Analysis Work Plan. A Project Area Reconnaissance will / will not be conducted for this project. (*X Staff x 0.0 days).*

The CONSULTANT will identify noise-sensitive land uses in the vicinity of the project. Noise sensitive land uses will be classified per the Noise Abatement Criteria (NAC) specified in the NCDOT Traffic Noise Policy. If applicable, equivalent receptors will be calculated per NCDOT Traffic Noise Manual at \_\_\_\_\_ locations. The CONSULTANT will coordinate with the applicable local government to identify all noise-sensitive land uses with an approved building permit. Based on a review of project mapping, it is estimated that approximately \_\_\_\_\_\_\_ receptors will be included in the noise modeling.

**1.B. Project Initiation Meeting and Noise Analysis Work Plan**

The CONSULTANT will meet with NCDOT Noise staff to determine specific parameters of the analysis, such as ambient noise monitoring locations, receptor numbers, likely abatement analysis locations and Noise Study Area limits. The Project Area Reconnaissance (if applicable) will be completed prior to the meeting. A Noise Analysis Work Plan will / will not be prepared. *(delete the next sentence if a work plan will not be prepared)* The draft Noise Analysis Work Plan (Section 8.6 of the Traffic Noise Manual) will be discussed during the meeting and finalized after the meeting. This meeting will confirm that the CONSULTANT is providing the level of detail desired by the NCDOT review staff. The project initiation meeting assumes *X Staff x 0.0 days.*

1. **Existing Base Year Noise Levels**

The CONSULTANT will evaluate the existing base year loudest-hour equivalent noise levels, Leq(h) for all noise-sensitive land use receptors within the study area with a combination of noise measurements and computer modeling.

**2.A. Ambient Noise Levels** *(this task can be deleted if no additional ambient noise measurements will be collected)*

Following approval of the Noise Analysis Work Plan and after obtaining an NCDOT right-of-entry letter, the CONSULTANT will collect ambient noise measurements. Short-term existing ambient Leq(h) noise level data will be obtained in one-minute increments for 20-minute periods at up to \_\_\_\_ (\_\_) representative areas as identified in the Noise Analysis Work Plan, with at least two (2), and preferably three (3), simultaneous measurements per representative area. If applicable, short-term existing ambient Leq(h) noise level data along low-volume roads will be obtained for a minimum of 30 minutes at up to \_\_\_\_ (\_\_) representative areas, with at least one (1), and preferably two (2), simultaneous measurements per representative area. A record of any unusual events and the time at which they occurred during the measurement period shall be documented. In accordance with NCDOT Traffic Noise Manual, short-term ambient noise measurement data will be obtained in a geometric array of integrating sound level analyzers. If applicable, \_\_\_\_ (\_\_) long-term existing ambient Leq(h) noise level data location(s) will be obtained for up to 24 hours. The need for, and locations of, long-term measurements will be determined on a case-by-case basis and will be identified in the Noise Analysis Work Plan. All integrating sound level analyzers (meters) used to obtain existing ambient noise monitoring data shall meet ANSI and IEC Type I or Type II specifications. Simultaneous traffic will be counted and classified during each short-term noise measurement session for which data is obtained in the vicinity of existing traffic noise sources. A traffic noise modeler or reviewer who is prequalified by NCDOT must be present during all data collection in the field. *X Staff x 0.0 days*

**2.B. Baseline TNM Model**

Using acceptable and NCDOT-prescribed TNM modeling methodologies, the field-collected traffic data will be used to create a validated TNM 2.5 model of the traffic noise environment during the ambient noise monitoring sessions. TNM model validation will be acceptable when the Leq(h) modeled noise levels are within ± 3.0 dB(A) of the ambient data Leq(h) for all noise monitoring receptor locations for which traffic was dominant. All TNM validation models must be approved by NCDOT prior to predicting existing and future noise levels. NCDOT will provide comments on the submitted TNM validation files within 5 business days. This scope of work assumes that TNM model validation will be needed at \_\_\_\_\_\_ sites. *(this paragraph can be deleted if no additional model validation is needed)*

Existing loudest-hour noise levels will be assessed for all noise-sensitive land use receptors identified in Task 1.A. as the greater of field-monitored equivalent noise levels, or the hourly-equivalent noise levels predicted by TNM assessment of existing base-year peak-hour traffic volumes and speeds into the validated existing-condition TNM model(s).

1. **Design Year Noise Levels**

The CONSULTANT will use TNM®2.5 to predict \_\_\_\_\_\_\_\_\_\_\_\_ design year loudest-hour equivalent traffic noise levels at all noise-sensitive land use receptors identified in Task 1.A. Design year \_\_\_\_\_\_\_\_\_\_\_\_ TNM models will incorporate the build-condition design elements (these elements will be based on the best design information available at the time of the modeling), as defined in the NCDOT Traffic Noise Manual, into the validated existing-condition TNM models. The following alternatives will be assessed in the Final Design Traffic Noise Analysis: No-Build Alternative and \_\_\_\_ (\_\_) Build Alternative(s).

TNM-predicted design year \_\_\_\_\_\_\_\_\_\_\_\_ loudest-hour noise levels will be assessed for all noise-sensitive land use receptors identified in Task 1.A.

Design Year \_\_\_\_\_\_\_\_\_\_\_\_ traffic noise impacts will be assessed per the NCDOT Noise Abatement Criteria and Substantial Increase criteria (the increase in predicted design year loudest-hour equivalent noise levels over existing base year loudest-hour equivalent noise levels).

The CONSULTANT will prepare \_\_\_\_\_\_\_\_\_\_\_\_ Design Year noise contours to assist land use planning efforts by local governments. It is anticipated that noise contours will be needed at \_\_\_\_\_\_ locations.

1. **Noise Abatement**

The CONSULTANT will assess potential noise abatement measures defined by the NCDOT Traffic Noise Policy for all traffic noise impacts, if any, resulting from the project. In accordance with NCDOT Traffic Noise Manual, the CONSULTANT will use TNM®2.5 to model and assess noise barrier(s) as a potential abatement measure per applicable NCDOT Traffic Noise Policy criteria. For the purposes of this scope of work, noise abatement will be considered for up to \_\_\_\_ (\_\_) Noise Study Areas (NSA’s) for \_\_\_\_ (\_\_) Build Alternative(s).

The results of this assessment shall be included in the Design Noise Report, with a discussion of the applicability of each potential abatement measure, based upon known project design and right of way limitations. The CONSULTANT will use TNM®2.5 to model and assess all noise barrier(s) that are considered for implementation as a potential abatement measure, per applicable NCDOT Traffic Noise Policy criteria. The noise barrier(s) will represent optimized design(s) that will preliminarily indicate feasibility and reasonableness of noise abatement for predicted traffic noise impacts. The CONSULTANT will prepare \_\_\_\_ (\_\_) Barrier Envelope Drawings. Barrier Envelope Drawings are required for the recommended barrier(s) only.

1. **Noise Report**

The CONSULTANT will prepare a draft and final Design Noise Report. The Design Noise Report will contain the elements and follow the guidelines prescribed in the NCDOT Traffic Noise Manual. A qualitative discussion of construction noise shall be included in the report. The final Design Noise Report shall be signed by a NCDOT-approved noise modeler and reviewer and shall be sealed by a Professional Engineer registered in North Carolina. However, the Barrier Envelope Drawings in the Design Noise Report do not have to be sealed by a Professional Engineer. “Streamlined Traffic Noise Text”, per NCDOT guidance, will be prepared by the CONSULTANT for inclusion in the environmental document *(if the environmental document has been approved, this task won’t be needed and the sentence can be deleted)*. In addition, the final Design Noise Report shall be accompanied by a matrix that details how each NCDOT comment is addressed in the final Design Noise Report.

1. **Deliverables**

The CONSULTANT will provide the following deliverables to NCDOT:

1. Noise Analysis Work Plan *(if applicable; otherwise, delete)*
2. All TNM Validation Files to satisfy Existing Base Year conditions
3. All TNM Models (electronic copy)
4. Draft Design Noise Report (1 electronic copy)
5. Revised Design Noise Report with NCDOT comments response matrix
6. Final deliverables, including:
   1. 2 hard copies of signed report with appendices
   2. Electronic copy of all final deliverables placed on the project’s SharePoint Connect site, including:
      1. Pdf of final, complete report with appendices
      2. MS Word version of the body of the report
      3. TNM files and CADD files
   3. \_\_electronic copy(ies) of report with appendices on CD or DVD;
7. “Streamlined Traffic Noise Text” *(if applicable; otherwise, delete)*

Prequalification Requirements

The Design Noise Report must be signed by CONSULTANT staff prequalified by NCDOT as an Analyst and a Reviewer under Work Code 00441 (Design Noise Report). The CONSULTANT proposes *insert staff name* as the Analyst and *insert staff name* as the Reviewer. The Analyst and Reviewer cannot be the same individual. Also, the Design Noise Report must be signed by a Professional Engineer licensed in North Carolina. The CONSULTANT proposes *insert staff name* as the supervising engineer responsible for sealing the Design Noise Report. These staff must be included in the CONSULTANT workday estimate.

Firm-owned noise meters will be paid for at the fixed rate of $25/day.

Estimates that include noise meter rentals must include rental quotes on rental firm letterhead.

No charges will be allowed for firm-owned tripods.