



1.0 SCOPE

EDR-7 is a Requirement that outlines the procedure all RTD project design engineers and project teams must follow to request, review, approve, deny, track, and file deviations to RTD criteria for all projects throughout the RTD system including: BRT; CRT; LRT; park-n-Rides; and Maintenance Facilities. It also applies to design options already integrated into RTD design criteria manuals that require RTD approval. Any deviation, discrepancy, or unusual solution must be approved by RTD in writing, in accordance with this EDR-7 procedure, before it can be included in the design.

2.0 PURPOSE & NEED

During the design phase of a project, there may be specific instances in which the Design Engineer needs to deviate from accepted RTD criteria in order to develop a solution to a particular design problem. There are many steps and RTD staff members involved in the Variance process so it is important to ensure all Variance requests are processed in the same way. It is important that all staff involved in Variance requests understand how this process works. At the end of each project all project Variances (approved and denied) are merged into a system-wide MASTER Variance tracking Log for future record. When this process is properly followed, RTD staff members can obtain Variance information for any part of the RTD system when needed.

3.0 STAFF RESPONSIBILITIES

STAFF	RESPONSIBILITIES FOR EDR-7
RTD CP Engineers	Acts as Variance Coordinator Performs Level 1 Variance Request Reviews
RTD CP Engineering Managers	Performs Level 2 & 3 Variance Request Reviews
RTD Project Managers	Enforces EDR-7 Performs Level 2 Variance Request Reviews
RTD Project Teams	Evaluate potential design solutions thoroughly to minimize the need for Variance requests. Follows EDR-7 procedure to request Variances.
RTD Non-Engineering Staff	Follows & Enforces EDR-7 ESSC performs Level 4 Variance Request Review
RTD Document Control	Assist in posting final Design Variance Request Packages to the appropriate location (eRoom, ACONEX, Project Wise, or other location)
Contractors / Consultants	Adheres to the regulations in EDR-7 May act as Variance Coordinator May NOT perform Level 1 Variance Request Review May Perform Level 2 Variance Request Review



4.0 VARIANCES DETAILS

4.1 General

Deviations may be made within the framework of accepted RTD design criteria to meet the requirements of a particular design problem. However, any deviation, discrepancy, or unusual solution must be approved by RTD in writing before it can be included in the design. It is the responsibility of the Design Engineer to identify, explain and justify any deviation from the established criteria and to secure the necessary approvals from RTD.

Design variance requests can be submitted from an external source (Contracted Consultant Designer, Utility Owner, etc.) or from an internal source (RTD engineer or other staff member).

There are four levels of RTD review for design variance requests:

- Level 1 review = each engineering discipline (must be an RTD employee),
- Level 2 review = Engineering Manager (may be RTD or Project Team),
- Level 3 review = RTD Senior Manager of Engineering / Chief Engineer,
- Level 4 review = RTD Executive Safety and Security Committee.

All variance requests will require a Level 3 review. However, not all variance requests will require a Level 4 review. Minor variance requests, such as those options already in the criteria manual that require RTD approval, or designs that meet an absolute minimum requirement but do not meet a desired minimum requirement, or design issues that do not impact safety, operations, or maintenance of RTD facilities may only require Level 3 sign-off. The Design Engineer may suggest the type of variance they are submitting (Level 3 or Level 4). However, the Senior Manager of Engineering / Chief Engineer will make the ultimate determination if a request needs Level 4 Approval.

The RTD Engineering Discipline Lead for the project matching the variance discipline shall coordinate the review process for a given variance request and will be responsible for obtaining and adding any missing information needed to complete the Design Variance Review Package and for guiding that variance request through the required review process and obtaining sign-off, comments, and recommendations at each level of review.

Communication is the key component to making this process efficient. When designs are done by outside Consultants, RTD shall work with the Design Engineer to establish early lists of potential variance requests and to understand the need for each potential variance. When necessary, information should be shared with RTD Safety, Operations and Maintenance departments to ensure initial buy-in of an idea or concept before too much time is invested.



Note: The review and approval of a variance should consider the impact of the variance on the overall system. Such impacts could include compatibility, systems integration, safety, reliability, constructability, maintainability, life cycle costs, and other factors.

All variance requests shall use the appropriate variance forms and be tracked in the appropriate RTD Variance Log.

The complete RTD variance review process will take an average of two weeks for most Level 3 design variance requests. The process could take up to four weeks longer for variances that need to be reviewed by the RTD Executive Safety and Security Committee, since the committee meets monthly. When project schedules are tight, it is recommended that project teams have regular variance meetings to keep Design Engineers and RTD Engineering Discipline Leads in the loop as Variances are debated. RTD Level 1 Variance Reviewers can also benefit from regular variance review meetings during projects to save the Variance Coordinator time having to bring Design Variance Request Packages around to every discipline and repeat the same explanations. Variance meetings also allow inter-disciplinary discussion of variance impacts.

Note: If a design does not meet the criteria of a city or entity other than RTD, the designer must obtain a variance from that entity. RTD does not need to review or approve a variance request for deviations to non-RTD criteria, but RTD will require written proof that this variance was issued by the governing entity.

4.2 Design Engineer Evaluation of Potential Solutions

The Design Engineer should first identify the particular RTD criterion that is in conflict with their design needs, and evaluate potential solutions to the problem. Throughout the evaluation process, the Design Engineer shall keep RTD informed of the potential need for a variance to the criteria, and begin discussing the design challenge with all potentially impacted disciplines. If no solution can be achieved that will meet RTD requirements, the Design Engineer shall document all solutions that were proposed and the grounds for why they were deemed to be inappropriate or unreasonable. If the criteria can be achieved, but there are potential benefits that may be received by varying from the criteria, those reasons shall be documented as well.

4.3 Design Engineer Preparation of Variance Request Package

A Design variance request may be originated by the Design Engineer, a Utility Owner, an RTD engineer, other RTD staff, or other entity effecting design. For a variance request to be considered, a Design Variance Request Package must be submitted to RTD:



- A. Notify the RTD Engineering Project Manager that a request for a variance to RTD design criteria is being prepared.
- B. Complete the 1st page of the "Request for Design Variance" form (Form 7-1) and compile a request package that addresses the following key elements:
 - Design Engineer contact information;
 - Date submitted and desired response date;
 - Indicate, by making **bold** and underlining, whether it is an 'External' variance (submitted by a consulting team) or 'Internal' variance (submitted by RTD staff);
 - Indicate, by making **bold** and underlining, your suggestion if you think the variance will be a 'Level 3' or 'Level 4' variance, this can be changed by the RTD Engineering Manager and/or RTD Senior Manager of Engineering / Chief Engineer;
 - The effected project location(s) including closest street name and RTD STA;
 - A brief description of the change/modification;
 - The reason for the change/modification (list specific RTD criteria manuals and sections not met), explaining why other solutions did not work;
 - Cost savings or loss;
 - Schedule savings or loss;
 - The technical discipline(s) that will or may be impacted by the variance with an explanation of the impacts the variance may have on the project and/or the discipline;
 - The potential advantages and disadvantages of the variance (don't forget to list resources required to implement the change – material, engineering and development, etc.).
- C. Attach supporting documentation (Calculations, Drawings, Reports, Research, Letters, etc.). Supporting exhibits will help greatly to speed up review time.
- D. Finally the Design Engineer shall deliver the Design Variance Request Package to the RTD Engineering Discipline Lead for the project, in the discipline specific to the variance request, who will act as the RTD Variance Coordinator for that Design Variance Request Package and guide it through the RTD review process. Although, not typical, the Project Manager can also act as the RTD Variance Coordinator.

Note: Variance Coordinators may be asked to help start and/or complete the Variance Request form and assemble the supporting information.

4.4 Level 1 – RTD Engineering Staff Review

During the Level 1 review process, every proposed design variance will be subjected to a technical review by each engineering discipline at RTD (must be by an RTD employee) in accordance to the following procedure:



- A. The RTD Variance Coordinator will log the proposed design variance information onto the 'Design Variance Log' (Form 7-3) {password to modify = 'variance'} and will file the required information in the next available 'Counter #' row, making sure to record which 'Counter #' was used on the top right corner of the 'Request for Design Variance' form (Form 7-1) in the space provided. The information needed in the Design Variance Log is as follows:
- FasTracks Corridor or Project Name;
 - Variance Discipline (the primary discipline effected by the variance);
 - Brief Variance Description;
 - Location of Variance (put both street & STA);
 - Cost Savings (or loss);
 - Date Variance was Initiated (to help track how long the variance process takes);
 - Variance Originator (Designer, Utility Owner, RTD, etc.);
 - RTD Variance Coordinator;
 - Variance Type (is it anticipated to be a Level 3 or a Level 4 Variance);
 - Variance Request # (assign a unique Variance Tracking # = 'Project Acronym / L3 or L4 / Next Sequential 4 digit # not used', enter this # in the Log, and enter this # in the box on the top right corner on the 1st and 2nd pages of the 'Request for Design Variance' form (Form 7-1));
 - Variance Status (is it in Level 1, 2, 3, or 4 review, rejected at Level 3, or Complete);
 - Pending Issues, Reason for Delay, Comment.
- B. After completing the Design Variance Log, the RTD Variance Coordinator shall circulate the Design Variance Request Package to all RTD disciplines for review. Each Project will have its own recommended Project generated RTD Discipline Reviewer List. The Variance Coordinator should make certain to obtain the List from the Deputy Project Manager, Design. The Variance Coordinator shall meet with each RTD Discipline Reviewer to explain the purpose of the variance and discuss the advantages and disadvantages of approving it. If schedule is tight, a meeting can also be used to achieve this effort so explanations and discussions only need to occur once.
- C. After reviewing the variance package, each RTD Discipline Reviewer will 'check' off that they reviewed the variance for relevance to their discipline, on the 2nd page of the 'Request for Design Variance' form (Form 7-1). Each reviewer must 'check' the box showing they reviewed the variance regardless of whether they support the variance or not.
- D. Occasionally the Variance will need to be routed to RTD Operations, RTD Maintenance, RTD Facilities, or another non-typical department to review the Variance request for other RTD concerns. In this case the 'Other' Box will be used.
- E. If the RTD Discipline Reviewer approves it, they will need to 'initial' approval of the variance.



- F. If the RTD Discipline Reviewer (or other RTD staff that reviews it) has an issue with the request (supporting or rejecting the variance), they will circle their discipline heading (or the 'other' heading), write 'see attached', and fill out their concerns on the 'Technical Impact Assessment' form (Form 7-2), and add it to the Design Variance Request Package before passing it back to the RTD Variance Coordinator. A Level 1 rejection does not 'Deny' the variance request. However, it is important to record disagreements as well as support for design variances. Engineers reviewing the variance requests are encouraged to attach their input on the appropriate variance form (see section 6.0 Attachments). Input will not be acceptable on sticky notes.
- G. If there are any outstanding technical or other issues that need to be resolved or if the Design Variance Request Package is missing information or key data, the RTD Discipline Reviewer can either request this information and postpone their review until the information is provided, or can make a 'conditional' decision to approve or reject the variance. For example, if a design variance would be acceptable as long as the designer meets a list of conditions, the list of conditions shall be written on the 'Technical Impact Assessment' form (Form 7-2) and the variance would be 'Approved'.
- H. After completing the review and adding any necessary input, the RTD Discipline Reviewer shall return the Design Variance Request Package back to the RTD Variance Coordinator so they may continue circulating the variance for review.
- I. After all RTD Discipline Reviewers have reviewed the variance, the RTD Variance Coordinator must recommend whether the variance request is:
- Mandatory (there are no other realistic options for design),
 - Highly Desirable (there may be other design options, but this is best choice),
 - Acceptable (this is one of the design options that works),
 - Conditional Approval (variance is accepted as long as the terms and/or specific requirements listed in the Level 1 – 'Engineering Discipline Lead Recommendation' section on page 2 of the 'Request for Design Variance' form (Form 7-1) are agreed to and met by the designer prior to construction),
 - Partial Approval (part of the variance request should be approved and part of the variance should be rejected),
 - Reject (the design variance requested is faulty or no good).
- Remember, a variance cannot be 'Denied' at a Level 1 review, it can only be recommended for 'rejection'.



- J. Next the RTD Variance Coordinator will summarize impacts and concerns that arise from the discipline review, coordinate with the project's engineering design staff to resolve any outstanding issues, conditions, add final comments (including rebuttal to any discipline recommendations for rejection), and will note any outstanding issues that can not be resolved before proceeding. If the RTD Variance Coordinator recommends a Partial Approval, the recommendation needs to define which part(s) should be approved and which should be rejected and explain why.
- K. The RTD Variance Coordinator may want to hold onto a Variance Package until Outstanding issues or Conditional requirements are met before continuing with the review process. If this is not possible, the RTD Variance Package may continue the review process with the caveat that any Conditional Approval will make the Conditions listed on the 'Request for Design Variance' form (Form 7-1) and any associated 'Technical Impact Assessment' forms (Form 7-2) part of the Contract Requirements for that project. The Contractor will be required to provide proof to the Project Manager that the Variance Conditions have been met if the Variance is applied to the project design and construction. Ultimately such design conditions and variances must be shown on Project As-Builts and noted as 'per Variance #__'.
- L. Finally, the RTD Variance Coordinator will scan the Design Variance Request Package to the appropriate project location (eRoom, ACONEX, Project Wise, local RTD Project Drive, or other location) and submit the original copy of the Design Variance Request Package to the appropriate RTD Engineering Manager for Level 2 review.

4.5 Level 2 – RTD Engineering Manager Review

The Level 2 design variance review is performed by RTD Engineering Managers or by the RTD Project Manager for the project. A non-RTD Project Manager may perform Level 2 reviews if they are contracted by RTD as the Project Manager for the project. Level 2 reviews are performed in accordance with the following procedures:

- A. The Engineering Manager will review the Level 1 summary documentation and determine if the staff level recommendation is acceptable.
- B. The Engineering Manager will document their concerns and comments in the 'Comments' area in the Level 2 section on the 2nd page of the 'Request for Design Variance' form (Form 7-1).
- C. If the recommendation is acceptable and there are no outstanding issues, the Engineering Manager shall check the 'Approved' box and sign and date the designated Level 2 section on the 2nd page of the 'Request for Design Variance' form (Form 7-1).



- D. If the Engineering Manager does not approve the variance request, they shall check the 'Denied' box and sign and date the designated Level 2 section on the 2nd page of the 'Request for Design Variance' form (Form 7-1). Similar to a Level 1 review, a Level 2 denial does not 'Deny' the variance request. It acts as a recommendation to the Level 3 & Level 4 reviewers.
- E. If there are any outstanding technical or other issues that need to be resolved or missing information or key data, the Engineering Manager shall either return the variance package to the Variance Coordinator who will coordinate the necessary action items until a resolution can be met, or can pass the variance onto then next level of review with the pending issues noted. Depending on the type and significance of the missing information, a variance may advance through the highest level of review and gain Conditional Approval.
- F. The Engineering Manager can change the Level 3 or Level 4 selection on the 1st page of the 'Request for Design Variance' form (Form 7-1) if necessary.
- G. The Engineering Manager will then submit the variance package to the Senior Manager of Engineering / Chief Engineer for Level 3 Review.

4.6 Level 3 – RTD Senior Manager of Engineering / Chief Engineer

The Level 3 review is performed by the RTD Senior Manager of Engineering / Chief Engineer, and in accordance with the following procedures:

- A. The Senior Manager of Engineering / Chief Engineer will review the Level 1 summary documentation and any Level 2 comments, and will determine if the recommendations are acceptable.
- B. The Senior Manager of Engineering / Chief Engineer will document their concerns and comments in the 'Comments' area in the Level 2 section on the 2nd page of the 'Request for Design Variance' form (Form 7-1).
- C. If the recommendation is acceptable and there are no outstanding issues, the Senior Manager of Engineering / Chief Engineer shall check the 'Approved' box and sign and date the designated Level 3 section on the 2nd page of the 'Request for Design Variance' form (Form 7-1).
- D. If the Senior Manager of Engineering / Chief Engineer does not approve the variance request, they shall check the 'Denied' box, write their concerns in the Comments area, and sign and date the designated Level 3 section on the 2nd page of the 'Request for Design Variance' form (Form 7-1).
- E. Unlike the previous Levels of review, a Level 3 denial does 'Deny' the variance request. If this occurs, the 'Denied' variance is sent to the Variance Coordinator to record the result in the Variance Log and to return it to the Design Engineer to inform them that they must either re-design to the RTD criteria or re-evaluate a new variance idea.



- F. If there are any outstanding technical or other issues that need to be resolved or missing information or key data, the Senior Manager of Engineering / Chief Engineer shall either return the Design Variance Request Package to the Variance Coordinator who will pursue the necessary action items until a resolution can be met, or can pass the variance onto then next level of review with the pending issues noted. Depending on the type and significance of the missing information, a variance may advance through the highest level of review and gain Conditional Approval.
- G. The Senior Manager of Engineering / Chief Engineer can also make final determination if a Level 4 review is needed (includes input from other departments such as Safety, Security, or Operations and Maintenance) and can change the selection on the 1st page of the 'Request for Design Variance' form (Form 7-1) if necessary.
- H. The Senior Manager of Engineering / Chief Engineer will then return the Design Variance Request Package to the Variance Coordinator.
- I. If the variance is allowed to stop at a Level 3 review, the Variance Coordinator will complete the Variance Log with the concluding 'Approved' or 'Denied' result and will proceed with finalizing the variance process (see 5.8 below).
- J. If a Level 4 review is required, the Variance Coordinator shall scan the Level 3 signed Design Variance Request Package and replace/update the copy located in the appropriate project location (eRoom, ACONEX, Project Wise, local RTD Project Drive, or other location) and send the original signed copy of the Design Variance Request Package to the Executive Safety and Security Committee Chairperson for Level 4 review and signature (see 5.7 below).

4.7 Level 4 – RTD Executive Safety and Security Committee

The Level 4 review is performed by the RTD Executive Safety and Security Committee (ESSC), which is a group containing RTD departments such as safety, security, operations, and maintenance. The ESSC review is performed in accordance with the following procedures:

- A. If a variance request requires a Level 4 review, the ESSC Chairperson shall present the Design Variance Request Package to the ESSC board for review. The ESSC Chairperson will decide if the particular variance can be added to a regular ESSC monthly meeting, if a special meeting is required, or if the variance can be distributed and voted on via mail or email.
- B. The RTD Variance Coordinator responsible for the Design Variance Request Package and, if necessary, the originator (consultant Design Engineer, Utility Owner, RTD Design Engineer, etc.) shall attend the ESSC Board meeting, upon request by the ESSC Chairperson, and present the design variance and recommendation to the ESSC at the meeting or thru email if no meeting is set up. This gives the Design Engineer the opportunity to clarify any issues and, if necessary, to defend the variance.



- C. The ESSC will be given the opportunity to comment on the variance request and make a final determination to either 'Approve' or 'Deny' the variance request.
- D. The ESSC Chairperson shall sign on behalf of the Committee in the Level 4 section of the 2nd page of the original copy of the 'Request for Design Variance' form (Form 7-1).
- E. If the variance is denied by the ESSC, the Chairperson shall write the reason for the rejection in the 'Comments' area in the Level 4 section on the 2nd page of the 'Request for Design Variance' form (Form 7-1).
- F. The ESSC Chairperson shall complete the ESSC section of the 'Design Variance Log' (Form 7-3) and then return the original signed, 'Approved' or 'Denied', Design Variance Request Package back to the Variance Coordinator.
- G. The Variance Coordinator will update the Variance Log with the final result, 'Approved' or 'Denied', will scan the final signed Design Variance Request Package and replace/update previous copies (eRoom, ACONEX, Project Wise, or RTD Project Drive).

4.8 RTD Finalizing the Request for Variance

Once a Design Variance Request Package has completed the review process, the following shall be performed:

- A. The Variance Coordinator shall be responsible for ensuring that the final Design Variance Request Package with all necessary signatures and attached supporting documentation has been scanned and placed in the appropriate project location on the local RTD network drive. The Variance Coordinator shall work with RTD Document Control to make sure the final Design Variance Request Package has also been filed in the appropriate official project forum (eRoom, ACONEX, Project Wise, or other location). Then the Variance Coordinator will notify the following personnel of the results:
 - Design Engineer or Contractor submitting the Variance Request;
 - Variance Coordinator;
 - Project Manager (RTD or Project Team);
 - Deputy Project Manager, Design (RTD or Project Team);
 - Engineering Manager (RTD or Project Team);
 - RTD Senior Manager of Engineering / Chief Engineer;
 - All RTD Project Team discipline Leads impacted by Variance decision.
 - All RTD Engineering discipline Team Leaders impacted by Variance decision;
 - Other RTD departments, as necessary (such as procurement, legal, policy, etc.); and
 - FasTracks QMO team (if the variance has been approved) for inclusion in the quality database in the event that the variance alters design criteria on a corridor or project wide basis.



- B. The Design Engineer shall proceed with design as directed.
- C. Approved and Denied Variances shall be formally transmitted to the contractor.
- D. Important Note: Each Project Team shall maintain their own individual project Variance Logs and Variance Packages, and shall make these documents (excel, word, and pdf versions) available to all RTD staff. The RTD home-office is maintaining a MASTER Variance Log that will combine Variance information from all RTD projects with links to the pdf's of each approved and denied Variance Package. New RTD project Variance Requests can also benefit from the language and supporting documentation of previous (approved/denied) Variance Requests. It is required that all RTD staff has, at a minimum, read-access to all Project Team Variance files.

4.9 Versioning Variances and Graveyard Variances

Versioning Variances occurs when, during the Variance Request review process and after Level 1 review and sometimes after Level 2 review, new information is learned or new engineering direction is decided upon that changes the design information for the Variance Request. Variance Requests that undergo changes during the review process and are still needed shall be Versioned by the Variance Coordinator together with the Level 1 Engineering Discipline Lead, who shall:

- Take the original 'Request for Design Variance' form (Form 7-1) and append the Variance Request # at the top of both pages 1 & 2 with the letter 'A' in red.
- Create a second 'Request for Design Variance' form (Form 7-1) with the exact same Variance Request # at the top of both pages 1 & 2 but append the # with a 'B' in red. The 'B' will indicate that there was a previous version.
- Fill out "Request for Design Variance" form (Form 7-1) 'B' with the new information on the 1st page. Next under 'Level 1 – Engineering Discipline Lead Recommendations, Final Comments' on the 2nd page indicate if the situation became better or worse with the changes, explain why, and indicate if Level 1 review was re-done or not.
- If the change worsens the situation, write (a diagonal dated watermark) 'SUPERSEDED month/day/year' in red across both pages 1 & 2 of the Original Variance Request form 'A', attach it behind the new Variance Request form 'B', and resubmit for Level 1 review.
- If the change improves the situation, write (a diagonal dated watermark) 'SUPERSEDED month/day/year' in red across page 1 only, page 2, attach it behind the new Variance Request form B, and procedure to Level 2 review. Level 1 review does not need to be repeated if Level 1 reviewers recommended approval of the Variance Request under worse conditions that now have improved. If some Level 1 reviewers recommend rejecting the Variance Request, then it is recommended the new Variance Request is re-submitted to those Level 1 reviewers with the improved situation.



- Update the Variance Log entry to explain the change. Do not change the Variance Counter #. Do not add the 'A' or 'B' to the Variance Request # on the Log, but indicate in the Comment column that this is a Versioned Variance and why.

Versioned Variances (including 'A' and 'B' forms and all supporting documentation) shall then be submitted for Level 2 review or re-submitted for Level 2 review regardless of the nature of the change.

Graveyard Variances are approved or denied Variance Requests that have fully completed the review process but changes to project design make the Variance # longer necessary. If this occurs, the Variance Coordinator shall:

- Rename the scanned Variance Package file to read '*ProjectAcronym GraveyardVariance – Discipline – VarianceRequest# – Brief Descriptor – Date*' (for example 'NM GraveyardVariance – Track – NML3-0001 – SpiralLengths – 031510'),
- Move the scanned Graveyard Variance packages to the Graveyard Variance sub-folder in the project Variance parent folder on the network drive,
- Add 'Graveyard Variance' with a brief description of why the Variance is no longer needed in the comments column on the Design Variance Log.

These shall be kept for future reference and in the case the design requires changing back to an earlier design or another location requires a similar Variance Request.

Important Notes Regarding Variance Request Numbers and Counter Numbers

1. Versioned Variances shall maintain their original Variance Request #'s. They are NOT to be changed, unless the new information changes the Variance from a L3 to a L4 or vice-versa in which case the new Variance Request # shall be the next available.
2. Letter appended Variance Request #'s shall only be used for Versioning Variances and shall not be used for any other reason.
3. Graveyard Variances shall maintain their Variance Request #'s (they shall not be re-assigned).
4. Counter #'s shall not be changed for Versioned Variances nor for Graveyard Variances.

5.0 REFERENCES

- A. RTD Standard Operating Procedure 101.11, Light Rail System Change/Modification Procedure
- B. RTD Light Rail Design Criteria
- C. RTD Commuter Rail Design Criteria
- D. RTD Maintenance Facility Criteria
- E. RTD Bus Transit Facility Design Guidelines
- F. FasTracks Quality Management Program Manual
- G. FasTracks Project Control Procedures Manual
- H. RTD Systems Safety and Security Program Plan



6.0 ATTACHMENTS

- Form 7-1: Request for Design Variance
- Form 7-1a: Request for Design Variance (continuation sheet)
- Form 7-2: Technical Impact Assessment
- Form 7-3: Design Variance Log

7.0 APPROVAL

Revision Level:	Approved By:	Signature	Date
Minor Revision	Kirk Strand Engineering Services Manager		2-5-15
Minor Revisions	Stan Szablek Civil Engineering Manager		2-9-15
Major Revision	Henry Stoppicamp Senior Manager Engineering / Chief Engineer		2-12-15

8.0 REVISION RECORD

Revision Level	Revision Date	Summary	Approval Date
0	10/12/07	Initial Baseline Issue	10-16-07
1	2/21/13	Update Staff Titles and Clarify which Staff is allowed to Perform Level Reviews added requested clarifications	2-22-13
2	2/21/13	New Chapter Title, Changes to Chapter Format, Updated RTD Logo, Further Clarifications, Procedure for Conditional Approvals, Procedure for Versioning Variances and Graveyard Variances, Maintenance of MASTER Variance Log	2-12-15



VARIANCE REQUEST NO:

(FasTracks Doc Control only)

REQUEST FOR DESIGN VARIANCE

VARIANCE LOG COUNTER # _____

RTD PROJECT: _____ RTD STAFF ASSIGNED: _____ EXT: _____
DESIGN ENGINEER: _____ CONTACT PHONE NUMBER: _____
DATE SUBMITTED: _____ DESIRED RESPONSE DATE: _____

SELECT VARIANCE SOURCE & REQUIRED LEVEL OF REVIEW: [MAKE **BOLD** & UNDERLINE]

- EXTERNAL INTERNAL LEVEL 3 VARIANCE LEVEL 4 VARIANCE

LOCATION(S): [LIST STREET NAME (PROJECT STATIONING)]

DESCRIPTION OF VARIANCE: [ATTACH SUPPORT DATA SUCH AS REPORTS, CALCULATIONS, AND DRAWINGS]

REASON FOR VARIANCE: [LIST DESIGN CRITERIA THAT IS NOT BEING MET OR OTHER FACTORS]

IMPACTS TO PROJECT - DESIGN AND CONSTRUCTION: [MAKE **BOLD** & UNDERLINE ALL THAT APPLY]

COST SAVINGS, COST AVOIDANCE, OR COST INCREASE: \$ _____

SCHEDULE SAVINGS OR INCREASE: _____

- SAFETY OPERATIONS MAINTENANCE ENGINEERING DISCIPLINE: _____

EXPLAIN: _____

VARIANCE
ADVANTAGES: _____

VARIANCE
DISADVANTAGES: _____



VARIANCE REQUEST NO:

(FasTracks Doc Control only)

TECHNICAL DISCIPLINES: [CHECK BOX AFTER REVIEW, THEN INITIAL APPROVAL OR CIRCLE REJECTION]

- ARCHITECTURAL CIVIL ENVIRONMENTAL STRUCTURAL TRACK
- LANDSCAPE ARCH. DRAINAGE PARK-N-RIDES SYSTEMS UTILITIES
- OTHER: _____

SEE TECHNICAL IMPACT ASSESSMENT FORM (FORM 7-2) FOR ANY DISCIPLINE REJECTIONS OR COMMENTS

LEVEL 1 - ENGINEERING DISCIPLINE LEAD RECOMMENDATION: [CHECK BOX AND INITIAL RECOMMENDATION]

- MANDATORY HIGHLY DESIRABLE ACCEPTABLE
- CONDITIONAL APPROVAL PARTIAL APPROVAL REJECT

CONCERNS, CONDITIONAL APPROVAL TERMS, EXPLANATION OF PARTIAL APPROVAL, FINAL COMMENTS:

OUTSTANDING/PENDING ISSUES:

PRINT NAME

SIGNATURE

DATE

LEVEL 2 - RTD ENGINEERING MANAGER:

- APPROVED DENIED

[ENGINEERING TECHNICAL SERVICE, CIVIL ENGINEERING PROJECT, OR SYSTEMS ENGINEERING]

COMMENTS: _____

PRINT NAME

SIGNATURE

DATE

LEVEL 3 - RTD SENIOR MANAGER OF ENGINEERING:

- APPROVED DENIED

COMMENTS: _____

PRINT NAME

SIGNATURE

DATE

LEVEL 4 - EXECUTIVE SAFETY & SECURITY COMMITTEE CHAIRPERSON:

- APPROVED DENIED

COMMENTS: _____

PRINT NAME

SIGNATURE

DATE



VARIANCE REQUEST NO: _____

 Document Control

TECHNICAL IMPACT ASSESSMENT

RTD PROJECT: _____ ASSESSMENT DUE: _____

DESCRIPTION OF VARIANCE:

LOCATION(S): STA + MP _____ STREET _____

TECHNICAL DISCIPLINE BEING REVIEWED:

<input type="checkbox"/> ARCHITECTURAL	<input type="checkbox"/> CIVIL	<input type="checkbox"/> ENVIRONMENTAL	<input type="checkbox"/> STRUCTURAL	<input type="checkbox"/> TRACK
<input type="checkbox"/> LANDSCAPE ARCH.	<input type="checkbox"/> DRAINAGE	<input type="checkbox"/> PARK-N-RIDES	<input type="checkbox"/> SYSTEMS	<input type="checkbox"/> UTILITIES
<input type="checkbox"/> OTHER: _____				

DEFINE IMPACTS TO THIS DISCIPLINE: _____

DOES THIS VARIANCE VIOLATE ANY FEDERAL, STATE, OR LOCAL LAWS? NO YES

IF YES, EXPLAIN: _____

OTHER CONCERNS WITH THIS VARIANCE REQUEST: _____

RECOMMENDATION: MANDATORY HIGHLY DESIRABLE ACCEPTABLE REJECT

LEVEL 1 – ETSG STAFF:

REVIEWER: _____
PRINT NAME
SIGNATURE
DATE



REQUEST FOR DESIGN VARIANCE

VARIANCE REQUEST NO: _____

(RTD Doc Control only)

VARIANCE LOG COUNTER # _____

PROJECT TITLE: _____ RTD STAFF ASSIGNED: _____ EXT: _____
 PROJECT OWNER: _____ CONTACT PHONE NUMBER: _____
 DESIGN ENGINEER: _____ CONTACT PHONE NUMBER: _____
 DATE SUBMITTED: _____ DESIRED RESPONSE DATE: _____

SELECT VARIANCE SOURCE & REQUIRED LEVEL OF REVIEW: [TO BE COMPLETED BY RTD]

EXTERNAL INTERNAL LEVEL 3 VARIANCE LEVEL 4 VARIANCE

LOCATION(S): [LIST STREET NAME (PROJECT STATIONING)]

DESCRIPTION OF VARIANCE: [ATTACH SUPPORT DATA SUCH AS REPORTS, CALCULATIONS, AND DRAWINGS]

REASON FOR VARIANCE: [LIST DESIGN CRITERIA THAT IS NOT BEING MET OR OTHER FACTORS]

IMPACTS TO PROJECT - DESIGN AND CONSTRUCTION: [MAKE **BOLD** & UNDERLINE ALL THAT APPLY]

COST SAVINGS, COST AVOIDANCE, OR COST INCREASE: \$ _____

SCHEDULE SAVINGS OR INCREASE: _____

SAFETY OPERATIONS MAINTENANCE ENGINEERING DISCIPLINE: _____

EXPLAIN: _____

VARIANCE ADVANTAGES: _____

VARIANCE DISADVANTAGES: _____



VARIANCE REQUEST NO:

(RTD Doc Control only)

TECHNICAL DISCIPLINES: [CHECK BOX AFTER REVIEW, THEN INITIAL APPROVAL OR CIRCLE REJECTION]

- ARCHITECTURAL CIVIL ENVIRONMENTAL STRUCTURAL TRACK
- LANDSCAPE ARCH. DRAINAGE PARK-N-RIDES SYSTEMS UTILITIES
- OTHER: _____

SEE TECHNICAL IMPACT ASSESSMENT FORM (FORM 7-2) FOR ANY DISCIPLINE REJECTIONS OR COMMENTS

LEVEL 1 - ENGINEERING DISCIPLINE LEAD RECOMMENDATION: [CHECK BOX AND INITIAL RECOMMENDATION]

- MANDATORY HIGHLY DESIRABLE ACCEPTABLE
- CONDITIONAL APPROVAL PARTIAL APPROVAL REJECT

CONCERNS, CONDITIONAL APPROVAL TERMS, EXPLANATION OF PARTIAL APPROVAL, FINAL COMMENTS:

OUTSTANDING/PENDING ISSUES:

PRINT NAME

SIGNATURE

DATE

LEVEL 2 - RTD ENGINEERING MANAGER:

- APPROVED DENIED

[ENGINEERING TECHNICAL SERVICE, CIVIL ENGINEERING PROJECT, OR SYSTEMS ENGINEERING]

COMMENTS: _____

PRINT NAME

SIGNATURE

DATE

LEVEL 3 - RTD SENIOR MANAGER OF ENGINEERING:

- APPROVED DENIED

COMMENTS: _____

PRINT NAME

SIGNATURE

DATE

LEVEL 4 - EXECUTIVE SAFETY & SECURITY COMMITTEE CHAIRPERSON:

- APPROVED DENIED

COMMENTS: _____

PRINT NAME

SIGNATURE

DATE



TECHNICAL IMPACT ASSESSMENT

VARIANCE REQUEST NO: _____
Document Control

RTD PROJECT: _____ ASSESSMENT DUE: _____

DESCRIPTION OF VARIANCE:

LOCATION(S): STA + MP _____ STREET _____

TECHNICAL DISCIPLINE BEING REVIEWED:

<input type="checkbox"/> ARCHITECTURAL	<input type="checkbox"/> CIVIL	<input type="checkbox"/> ENVIRONMENTAL	<input type="checkbox"/> STRUCTURAL	<input type="checkbox"/> TRACK
<input type="checkbox"/> LANDSCAPE ARCH.	<input type="checkbox"/> DRAINAGE	<input type="checkbox"/> PARK-N-RIDES	<input type="checkbox"/> SYSTEMS	<input type="checkbox"/> UTILITIES
<input type="checkbox"/> OTHER: _____				

DEFINE IMPACTS TO THIS DISCIPLINE: _____

DOES THIS VARIANCE VIOLATE ANY FEDERAL, STATE, OR LOCAL LAWS? NO YES

IF YES, EXPLAIN: _____

OTHER CONCERNS WITH THIS VARIANCE REQUEST: _____

RECOMMENDATION: MANDATORY HIGHLY DESIRABLE ACCEPTABLE REJECT

LEVEL 1 – ETSG STAFF:

REVIEWER: _____
PRINT NAME SIGNATURE DATE

DESIGN VARIANCE LOG (FORM 7-3) FasTracks DESIGN Variance Log - NORTH METRO

Levels:	1 = Engineering Technical Service Discipline Review and Initials
	2 = ETS Manager Signature, then to Document Control for Variance # Assignment
	3 = Senior Manager of Engineering Signature, then back to Document Control for Scanning
	4 = Safety Committee Review, then Approves or Rejects Variance
	Variations granted for earlier (AECOM & URS) design and are no longer valid
	Approved Variations based on the current design

A Level 3 Variance = DOES NOT need to go to Safety Committee

A Level 4 Variance = NEEDS to go to Safety Committee

Number	FasTracks Corridor or Project Name	Variance Discipline	Brief Variance Description	Location of Variance	Who's Criteria / Manual / Section is the Variance Changing?	RTD Cost Savings / Cost Avoidance	Date Initiated	Variance Originated By (Designer, UO, RTD)	RTD Variance Coordinator (Design Lead)	Variance Type (Level 3 Variance or Level 4 Variance)	Variance # (Assigned by Variance Coordinator)	Safety Committee Variance #	Scheduled Date to Safety Committee (If any)	Variance Status (Level 1, 2, 3, 4)	Pending Issues, Reason for Delay, Comment	Finally Approved or Rejected by Senior Manager of L3 & by Safety Committee of L4	Reason if Rejected	Date Finalized, Signed and Scanned into Network, eForm, ACONEX, or ProjectWise	Assess Doc Register No./Mail number	Link to Submitted Variance Postage	
1	North Metro	Track	Spiral Length	North Metro / DUB	RTD	NA	15-Mar-10	URS Kim Probst	Albert Gomez	Level 3	NML3-0001	NA	NA	Complete	Overruled Variance: Approved but no longer needed due to alignment & design change	Approved		20-Oct-11	NMC-RTD-TRK-OVA-00004	Located in NML Variance Gateway folder	
2	North Metro	Track	Curve Length	North Metro / DUB	RTD	NA	15-Mar-10	URS Kim Probst	Albert Gomez	Level 3	NML3-0002	NA	NA	Complete	Overruled Variance: Approved but no longer needed due to alignment & design change	Approved		20-Oct-11	NMC-RTD-TRK-OVA-00001	Located in NML Variance Gateway folder	
3	North Metro	Track	Elevation Undersize	North Metro / South Platte Xing	RTD	NA	15-Mar-10	URS Kim Probst	Albert Gomez	Level 3	NML3-0002	NA	NA	Complete	Overruled Variance: Approved but no longer needed due to alignment & design change	Approved		20-Oct-11	NMC-RTD-TRK-OVA-00002	Located in NML Variance Gateway folder	
4	North Metro	Track	Tangent between Curves	North Metro / Delaney St	RTD	NA	15-Mar-10	URS Kim Probst	Albert Gomez	Level 3	NML3-0004	NA	NA	Complete	Overruled Variance: Approved but no longer needed due to alignment & design change	Approved		20-Oct-11	NMC-RTD-TRK-OVA-00003	Located in NML Variance Gateway folder	
5	North Metro	Track	Distance between PIS and PIS	North Metro / South Platte Xing	RTD	NA	15-Mar-10	URS Kim Probst	Albert Gomez	Level 3	NML3-0005	NA	NA	Complete	Overruled Variance: Approved but no longer needed due to alignment & design change	Approved		1-Nov-11	NMC-RTD-TRK-OVA-00007	Located in NML Variance Gateway folder	
6	North Metro	Track	Distance between PIS and Spiral	North Metro / South Platte Xing	RTD	NA	15-Mar-10	URS Kim Probst	Albert Gomez	Level 3	NML3-0006	NA	NA	Complete	Overruled Variance: Approved but no longer needed due to alignment & design change	Approved		1-Nov-11	NMC-RTD-TRK-OVA-00008	Located in NML Variance Gateway folder	
7	North Metro	Utilities - Gas	Allow 16" Crude Oil (Bunker) parallel to RTD ROW adjacent to NML tracks for 15.5 Miles	From Bunker Plant just S of Sand Creek to N of 168th Ave (just beyond end of NML corridor)	RTD / CRT Manual / Section 3.8.2.1	\$10 Million	28-Nov-12	UO / RTD	Jim Kallay	Level 4	NML-4-0001	TBD	14-Oct-12	Complete		Approved		21-Dec-12	NMC-RTD-CFL-RFR-000-10	NML Variance - Finalized - Approved and Documented Variance - URS - NML-4-0001 - Source: 16in Parallel to RTD ROW - Approved and Documented	
8	North Metro	Utilities - Gas	Allow 8 Non-Encased 16" Crude Oil (Bunker) crossings under CRT (2 x under CRT Bridge Structure, 4 x under tracks)	Crossings nearest 8 of 270, N of 270, 1-79, 88th Ave, 100th Ave, 104th Ave, 160th Ave, 168th Ave	RTD / CRT Manual / Section 3.8.3.7	\$10 Million	28-Nov-12	UO / RTD	Jim Kallay	Level 4	NML-4-0002	TBD	14-Oct-12	Complete		Approved		21-Dec-12	NMC-RTD-CFL-COM-00001-4-17	NML Variance - Finalized - Approved and Documented Variance - URS - NML-4-0002 - Source: 8in Parallel to RTD ROW - Approved and Documented	
9	North Metro	Utilities - Gas	Allow 10" Crude Oil (Bunker) parallel to RTD ROW adjacent to UPRR tracks for 1 Mile	Bunker Plant just S of Sand Creek, N on E side of Clinton Canal from the NML tracks (approx 3,000') to 66th Ave, E (approx 2,000') to UPRR tracks, then back S along the UPRR tracks (approx 3,000') to the Brighton / Colorado Blvd intersection N of Hwy 270	RTD / CRT Manual / Section 3.8.2.1	\$10 Million	28-Nov-12	UO / RTD	Jim Kallay	Level 4	NML-4-0003	TBD	14-Oct-12	Complete		Approved		21-Dec-12	NMC-RTD-CFL-COM-00001-4-18	NML Variance - Finalized - Approved and Documented Variance - URS - NML-4-0003 - Source: 10in Parallel to RTD ROW - Approved and Documented	
10	North Metro	Utilities - Gas	Allow 4 Non-Encased 16" Crude Oil (Bunker) crossings under CRT (2 x under CRT Bridge Structure, 2 x under tracks owned by RTD but operated by UPRR)	Crossings nearest 6 of 270, N of 270, 47th Ave & 68th Ave	RTD / CRT Manual / Section 3.8.3.7	\$10 Million	28-Nov-12	UO / RTD	Jim Kallay	Level 4	NML-4-0004	TBD	14-Oct-12	Complete		Approved		21-Dec-12	NMC-RTD-CFL-COM-00001-4-19	NML Variance - Finalized - Approved and Documented Variance - URS - NML-4-0004 - Source: 16in Parallel to RTD ROW - Approved and Documented	
11	North Metro	Safety - prof	Allow Bike Lanes closer than 200 ft from station platforms.	Midwest Western Stockyard Station (NML STA 270+00) & 72nd Station (NML STA 440+00)	RTD / CRT Manual / Section 1.4 Systems being a Security	NA	28-Nov-13	AECOM	Forrester	Level 4	NML-4-0000	TBD		Complete		Approved			NMC-RTD-CFL-COM-00001-4-09	NML Variance - Finalized - Approved and Documented Variance - URS - NML-4-0000 - Bike Lanes Distance to Platform - Approved and Documented	
12	North Metro	Track	Lateral Clearances to Crash Protected Bridge Piers does not meet Desired Minimum (12.5') but does meet Absolute Minimum (9.5') to accommodate selective clearances between bridge piers: 10.32' (SB Trk), 12.48' (NB Trk), 11.00' (SB Trk), 15.44' (NB Trk)	Part Avenue / Delaney Bridge Structure (NML STA 148+20 to STA 149+00)	RTD / Single Project Design Basis Manual / Section 4.2.3	NA	17-Dec-12	RTD	Albert Gomez	Level 3	NML3-0007	NA	NA	Complete	Variance Variance: Variance NML3-0007 was approved with Variance NML3-0078 between L1 & L2 Reverse in which situation improved, but still required a variance	Denial			NMC-RTD-CFL-COM-00001-4-10	NML Variance - Finalized - Approved and Documented Variance - URS - NML-3-0007 - Part Ave to Delaney Bridge - DENIED - Approved and Documented	
13	North Metro	Track	Curve SS does not meet Desired Minimum (1.87') but does meet Absolute Minimum (.7') which still allows acceptable passenger comfort, consistent with PRA regulations, and provides for increased train speed.	10 Curve Location: 10.32' (SB Trk), 12.48' (NB Trk), 11.00' (SB Trk), 15.44' (NB Trk)	RTD / Single Project Design Basis Manual / Section 4.2.3	NA	17-Dec-12	RTD	Albert Gomez	Level 3	NML3-0008	NA	NA	Complete	Variance Variance: Variance NML3-0008 was approved with Variance NML3-0078 between L1 & L2 Reverse in which situation improved, but still required a variance	Denial			NMC-RTD-CFL-COM-00001-4-11	NML Variance - Finalized - Approved and Documented Variance - URS - NML-3-0008 - Curve Length - Approved and Documented	
14	North Metro	Track	Allow significantly less than Absolute Minimum (86') Tangent due to limited horizontal clearances between bridge piers, both C2 (8.74') & C3 (12.42') which are mitigated by the spiral preceding the tangents	Underneath the Part Avenue overpass preceding curve 03 (NML NB STA 1160+77) and preceding curve 02 (NML NB STA 1145+00); and near 48th Avenue between curves C2 & C3 (NML STA 240+38)	RTD / Single Project Design Basis Manual / Section 4.2.3	NA	17-Dec-12	RTD	Albert Gomez	Level 3	NML3-0011	NA	NA	Complete	Variance Variance: Variance NML3-0011 was approved with Variance NML3-0078 between L1 & L2 Reverse in which situation improved, but still required a variance	Denial			NMC-RTD-CFL-COM-00001-4-14	NML Variance - Finalized - Approved and Documented Variance - URS - NML-3-0011 - Tangent Length - Approved and Documented	
15	North Metro	Track	Allow just below Desired Minimum (160') Tangent, both C2 (84.16') and C3 (88.37') and allow just below Minimum (100') Tangent, both C4 (83.79') and C5 (83.79') to accommodate selective clearances, safety track geometry below bridge piers, and increase train speed.	Underneath the Part Avenue overpass preceding curve 03 (NML NB STA 1160+77) and preceding curve 02 (NML NB STA 1145+00); and near 48th Avenue between curves C2 & C3 (NML STA 240+38)	RTD / Single Project Design Basis Manual / Section 4.2.3	NA	17-Dec-12	RTD	Albert Gomez	Level 3	NML3-0009	NA	NA	Complete	Variance Variance: Variance NML3-0009 was approved with Variance NML3-0078 between L1 & L2 Reverse in which situation improved, but still required a variance	Approved			NMC-RTD-CFL-COM-00001-4-12	NML Variance - Finalized - Approved and Documented Variance - URS - NML-3-0009 - Tangent Length - Approved and Documented	
16	North Metro	Track	Curve Ls less than Desired Minimum (100'), C1 (87'), C2 (83'), and C3 (80'), due to constraints of bridge, cross protected piers, and existing RR tracks	Beginning of the rail corridor centering out of DUB (the Thru) at 72nd Ave	RTD / Single Project Design Basis Manual / Section 4.2.3	NA	17-Dec-12	RTD	Albert Gomez	Level 3	NML3-0010	NA	NA	Complete	Variance Variance: Variance NML3-0010 was approved with Variance NML3-0078 between L1 & L2 Reverse in which situation improved, but still required a variance	Approved			NMC-RTD-CFL-COM-00001-4-13	NML Variance - Finalized - Approved and Documented Variance - URS - NML-3-0010 - Tangent Length - Approved and Documented	
17	North Metro	Track	Profile Grade is greater than Desired Minimum (0.5%). Grade at platform will be 0.74%. Absolute Max (1%) on all in the slowest range. Increase of grade is to accommodate clearance and grades for locomotion underpass	72nd Ave DM STA 480+00	RTD / Single Project Design Basis Manual / Section 4.2.3	NA	17-Dec-12	RTD	Albert Gomez	Level 3	NML3-0012	NA	NA	Complete	Variance Variance: Variance NML3-0012 was approved with Variance NML3-0078 between L1 & L2 Reverse in which situation improved, but still required a variance	Approved			NMC-RTD-CFL-COM-00001-4-15	NML Variance - Finalized - Approved and Documented Variance - URS - NML-3-0012 - Profile Grade at Station - Approved and Documented	
18	North Metro	Track	Curve M1, C1 does not meet the absolute minimum length.	DUB to In location - M1 Station 145+50-44 to 145+48.73	NM DM Section 4.2.3A, Table 4-3	NA	2-Jun-14	RRP	Karen Stanley	Level 3	NML3-0013	NA	NA	Complete	Variance Not Required				NMC-RTD-OVA-TRK-00003		
19	North Metro	Track	Tangent located between curves M1, C1 and M1, C2 does not meet the desirable or minimum horizontal length criteria.	DUB to In location - M1 Station 147+16.73 to 147+05.08	NM DM Section 4.2.2, Table 4-1	NA	2-Jun-14	RRP	Karen Stanley	Level 3	NML3-0014	NA	NA	Complete	Variance Not Required				NMC-RTD-OVA-TRK-00002		
20	North Metro	Track	Spiral curve provided between circular curves and horizontal tangents does not meet the minimum length criteria.	DUB to In location - M1 Station 144+42.44 to 150+30.41	NM DM Section 4.2.3B	NA	2-Jun-14	RRP	Karen Stanley	Level 3	NML3-0015	NA	NA	Complete	Variance Not Required				NMC-RTD-OVA-TRK-00004		
21	North Metro	Track	Curve RS 01 does not provide for spiral transition.	DUB to In location - M1 Station 1144+48.44 to 1145+33.36	NM DM Section 4.2.3B	NA	2-Jun-14	RRP	Karen Stanley	Level 3	NML3-0016	NA	NA	Complete	Variance Not Required				NMC-RTD-OVA-TRK-00005		
22	North Metro	Structure	Construction of Pier and Abutments for the 104th Ave Bridge at a skew angle greater than 30°.	Select Station location not identified	AREMA Manual Chapter 6.2.1.7	NA	14-Jul-14	RRP	Jennifer Whitehead	Level 3	NML3-0017	NA	NA	Complete	Variance Not Required	Denial	Lack of information and alternative solution does not resolve a variance.			NMC-RTD-OVA-TRK-00001	
23	North Metro	Track	Vertical curves #12, #13, & #14 cannot be optimized for 79' RRP.	M1 STA 277+47 to 280+56.41	DM Section 4.2	NA	23-Jul-14	RRP	Karen Stanley	Level 3	NML3-0018	NA	NA	Complete	Variance Not Required				NMC-RTD-TRK-OVA-00011		
24	North Metro	Track	Curves exceeding the desirable maximum superelevation of 1.5°	M1 STA 162+72.71 to 177+91.89	DM Section 4.2.3C	NA	23-Jul-14	RRP	Karen Stanley	Level 3	NML3-0019	NA	NA	Complete	Variance Not Required				NMC-RTD-TRK-OVA-00012		
25	North Metro	Track	Tangent between curves not meeting the desirable or minimum horizontal tangent length criteria.	M1 STA 246+09.54 to 248+01.61	DM Section 4.2.2	NA	23-Jul-14	RRP	Karen Stanley	Level 3	NML3-0020	NA	NA	Complete	Variance Not Required				NMC-RTD-TRK-OVA-00013		
26	North Metro	Track	Does not meet the desirable minimum length of 3' Max Speed for horizontal curves.	M1 STA 242+09.05 to 249+09.34	DM Section 4.2.3A	NA	23-Jul-14	RRP	Karen Stanley	Level 3	NML3-0021	NA	NA	Complete	Variance Not Required				NMC-RTD-TRK-OVA-00010		
27	North Metro	Track	Does not meet the desirable minimum length of 200' for vertical curves.	STA 84+82 to 87+90.84 and STA 87+08.13 to 100+22.44	DM Section 4.3.3	NA	23-Jul-14	RRP	Karen Stanley	Level 3	NML3-0022	NA	NA	Complete	Variance Not Required				NMC-RTD-TRK-OVA-00016		
28	North Metro	Track	Does not meet the minimum length of constant profile grade between vertical curves.	M1 STA 252+90.98 to 254+42.16	DM Section 4.3.2	NA	23-Jul-14	RRP	Karen Stanley	Level 3	NML3-0023	NA	NA	Complete	Variance Not Required				NMC-RTD-TRK-OVA-00015		
29	North Metro	Track	Exception for Spiral Curves	M1 STA 1217+16.48 to 1219+07.40	DM Section 4.2.3B	NA	23-Jul-14	RRP	Karen Stanley	Level 3	NML3-0024	NA	NA	Complete	Variance Not Required				NMC-RTD-TRK-OVA-00014		
30	North Metro	Structure	Concrete cover for the rebar at the bottom of the bridge is 1" instead of 1.5"	At all Bridges	AREMA Manual	NA	31-Jul-14	RRP	Jennifer Whitehead	Level 3	NML3-0025	NA	NA	Complete	Variance Not Required	Denial	Item needs to provide explanation			NMC-RTD-TRK-OVA-00001	
31	North Metro	Structure	Flashter spacing for CF composite rail bridges is 24" then the specified 30" spacing	At all Bridges	Modified Composite Rail Design Criteria	NA	11-Aug-14	RRP	Jennifer Whitehead	Level 3	NML3-0026	NA	NA	Complete	Variance Not Required	Conditional Approval				RRP-DCV-00016	