

REVIEW OF INCONSISTENCIES BETWEEN SUDAS AND IOWA DOT SPECIFICATIONS

Phase III: Continued Implementation of Recommendations into SUDAS Specifications

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Background Summary

In the 1990's, city, county, and utility agencies in the Des Moines metropolitan area joined together to develop the Des Moines Metropolitan Standards and Specification Committee, with the goal of developing a unified set of design and construction standards that could be applied to work within these communities. The work of these communities resulted in the development of the Urban Standard Specifications for Public Improvements, which were ultimately adopted in 1998. Communities outside central Iowa began to realize the potential cost savings from these new specifications, and adopted them for their own use. Growing interest carried the central Iowa specifications to statewide use, and eventually they were placed under the direction of the Institute for Transportation (InTrans). The SUDAS Specifications, developed from the original Des Moines Metropolitan Standards, have become the benchmark documents used for construction of water main, sanitary sewer, storm sewer, site improvements, and other urban items of work in Iowa.

As the use and influence of the SUDAS Specifications grew, they drew the interest of the Iowa DOT. Because the SUDAS specifications were developed specifically for urban construction, and because both designers and contractors are familiar with them, the Iowa DOT desired to utilize the SUDAS Specifications on federal aid projects in urban areas. However, due to differences with definitions, general conditions, and format between the Iowa DOT and SUDAS specifications, utilizing the SUDAS Specifications on DOT projects was difficult and therefore limited.

In response to this difficulty, a research project (now referred to as Phase 1) was initiated in 2004 to find the incompatibilities between the two sets of specifications and standard drawings. The ultimate goal of this project was to update both the DOT and SUDAS specifications to develop uniformity between the two documents. The project compared the following areas:

- Definitions and abbreviations
- Bid items, measurement, and payment
- Construction methods and materials
- Standard drawings.

Both specifications were also examined to identify all references to the contractual provisions portions of the documents (Division I of SUDAS and Division 11 of the DOT). The elimination of such references would make it possible to utilize the means and methods of one set of specifications with the general conditions of another. The specifications were also examined to determine areas of overlap and items of work covered by one and not the other.

Comparisons were made in 2005 and 2006, with a final report issued in May 2006.

In 2006, a second research project (now referred to as Phase 2) commenced with the intention of incorporating many of the recommendations made in the Phase 1 report. The Phase 2 project focused on sections of the SUDAS Specifications that were particularly

Background Summary

urban in nature including Trench and Trenchless; Sewers and Drains; Water Mains; Structures for Storm and Sanitary; and Driveways, Sidewalks, and Recreational Trails.

The work completed under Phase 2 included rewriting the specification sections described above to eliminate the inconsistencies identified under the Phase 1 project and redrafting 124 of the 240 SUDAS figures to a new landscape format similar to the Iowa DOT's Standard Road Plans.

While the Phase 2 project, and other related projects, eliminated a majority of the inconsistencies identified in Phase 1, portions of Division 7, Streets and Related Work, and Division 9, Site Work and Landscaping, still needed to be updated. To finish what was started with Phase 1, a third and final phase of the inconsistencies project was proposed.

Phase 3 addresses the remaining items in Division 7 including Section 7010, (PCC Pavement – figures only), Section 7020 (HMA Pavement - figures only), and Section 7040 (Pavement Rehabilitation). In addition, a majority of the specifications and figures in Division 9 also required updates to eliminate inconsistencies. This included Section 9020 (Sodding), Section 9030 (Plant Material and Planting), Section 9050 (Gabions and Rip Rap), Section 9060 (Fencing), Section 9070 (Retaining Walls), and Section 9080 (Concrete Steps and Handrail).

Project Objectives

The objective of the Phase 3 project was to re-write the identified sections of the SUDAS specifications into the imperative mood, consistent with the format utilized during the Phase 2 project and other work completed by SUDAS staff. Figures for the identified sections were updated to match the new SUDAS format, similar to the Iowa DOT Standard Road Plans. While the Iowa DOT does not intend to incorporate all of the following sections into their specification book, consistency with the Iowa DOT specifications was strived for wherever possible. Maintaining consistency between the specifications simplifies design, bidding, and construction.

The following summarizes the major objectives of this project:

1. Division 7: Streets and Related Work

Revise the specifications for Section 7040, Pavement Repair and Rehabilitation as follows:

- Eliminate discrepancies between the SUDAS and Iowa DOT specifications regarding sawcut requirements, patching materials, pavement mixes, and measurement and payment.
- Rewrite the specifications to the imperative mood.

2. Division 9: Site Work and Landscaping

Revise the specifications for Sections 9020, Sodding; 9030, Plant Material and Planting; 9050, Gabions and Rip Rap; 9060, Fencing; 9070, Retaining Walls; and 9080, Concrete Steps and Handrails as follows:

- Clarify sod watering and warranty requirements for SUDAS.
- Coordinate planting methods between SUDAS and the Iowa DOT specifications.
- Remove proprietary references within the gabions and retaining wall sections.
- Update the concrete steps and handrail specifications to comply with current ADA requirements.
- Rewrite the specifications to the imperative mood.

3. Standard Drawings

Revise the SUDAS figures for the following sections: 7010, PCC Pavement; 7020, Hot Mix Asphalt; 7040, Pavement Repair and Rehabilitation; 9030, Plant Material and Planting; 9050, Gabions and Rip Rap; 9060, Fencing; 9070, Retaining Walls; and 9080, Concrete Steps and Handrail as follows:

- Update figures to match the new SUDAS landscape format, similar to the Iowa DOT Standard Road Plans. Revise figures as necessary based upon the revised specifications.

Review Process

The specification revision process for each section began with Snyder and Associates staff reviewing the existing specifications and the conflicts identified during the Phase I project. Snyder then developed a plan for revising the specifications to eliminate these conflicts. For some of the specification sections, this required a complete restructuring and rewrite of the section.

Each of the revised specifications sections underwent a number of drafts before being presented to the committee for review. During the revision process, questions inevitably arose which required the consideration of the review committee. These questions were noted in the revised specifications for eventual discussion with and input from the review committee.

The final draft of the revised specifications sections was then presented to the committee for review and comment. The committee and Snyder staff reviewed each of the specifications section by section. Invaluable feedback was provided by the review committee. Through their input, additional changes were recommended and incorporated into the revised specification sections.

During the review period for a particular specification section, Snyder staff would begin the revisions to the SUDAS figures related to the specifications under review. Each of the figures was updated following the Iowa DOT's drafting standards for Standard Road Plans, with the exception of utilizing a larger font size upon request of the SUDAS Districts. During each figure's update, any errors were corrected and the language within the figure was revised to comply with the new specifications.

After completion of the specification review, the committee then had the opportunity to review and comment on the figures for that section.

The committee's recommended changes to the updated specifications and figures were incorporated and presented to them for final approval before moving on to the next specification section.

After receiving final approval from the review committee, the specifications and figures were presented to the SUDAS District Committees and Board of Directors for approval.

Results

General

All specification sections were re-written into the active voice, imperative mood to match the current SUDAS standard. In addition, the measurement and payment sections were updated into the current three-part standard.

A copy of the updated specifications and a summary of the revisions for each section is included in Appendix A.

A copy of updated SUDAS figures, along with a summary of major figure revisions is included in Appendix B.

A brief overview of revisions made to each section is presented below.

Division 7 – Streets and Related Work

- *Section 7010, Portland Cement Concrete Pavement & 7020, Hot Mix Asphalt Pavement*

The figures for Section 7010 (Portland Cement Concrete Pavement) and 7020 (Hot Mix Asphalt Pavement) were completely re-drawn. A number of these figures will be shared as joint figures between the Iowa DOT and SUDAS.

- *Section 7040, Pavement Rehabilitation*

Both the specifications and the figures for Section 7040 (Pavement Repair and Rehabilitation) were updated. The pavement repair methods described in the specifications and shown on the figures were updated based upon the Concrete Pavement Preservation Workshop Reference Manual, published by USDOT / FHWA in February of 2008. This manual, developed by the National Concrete Pavement Technology Center at InTrans, represents the current state of practice for pavement repair and rehabilitation.

Division 9 – Site Work and Landscaping

- *Section 9020, Sodding*

The warranty period, requiring the contractor to replace sod for up to one year was removed as it was deemed unreasonable and beyond the contractor's control. Fertilizer requirements were removed and replaced with references to the Iowa Department of Agriculture and the Iowa DOT. One question was left for SUDAS district consideration. The current SUDAS specifications only require the contractor to maintain (water, weed, mow, etc) the sod for 14 days. The committee's opinion is that this is not long enough for the sod to become established and take root. The committee

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recommends that the SUDAS districts consider increasing this to 30 days, which would match the Iowa DOT specifications.

– *Section 9030, Plant Material and Planting*

The most significant change to this section was an update to the plant establishment and warranty period. The previous SUDAS specifications required the contractor to warranty plants for one-year after initial acceptance and replace any dead plants or trees at the end of the warranty period. An additional one-year warranty would be included for any plants the contractor replaced. Theoretically, this could continue in perpetuity.

The revised specifications provide for a one-year establishment period for all plants. At the end of the period, any necessary replacements are made and the contract is completed. In addition, optional bid items were developed to provide for an extended warranty which stretches the establishment period to two-years. This configuration more closely matches the Iowa DOT's specifications, which provide options for either a one-year or two-year maintenance period.

The planting figures were updated to reflect changes in the specifications. Several of the planting figures were combined for clarity. The detail for the sidewalk tree well was eliminated as it contained project specific information.

– *Section 9050, Gabions*

Rip Rap was removed from this section, as it was previously included in Section 9040 as part of TR-508.

The title of this section was revised to Gabions and Revet Mattresses. Revet mattresses were included as they are commonly used in conjunction with gabion baskets. The material specifications for gabions were completely re-written. The previous specifications simply referenced an obscure federal specification for wire and specific manufacturers as approved products. The revised specifications refer to ASTM A 975 for the material requirements for gabion and revet mattresses. An option to specify PVC coated gabions or revet mattresses was also added.

The execution section was updated to include revet mattresses and more closely follow the typical order of installation.

A new figure detailing the assembly and installation of gabions and revet mattresses was developed.

– *Section 9060, Fencing*

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Updated the materials requirements to follow both Iowa DOT and current ASTM specifications for fence, posts, and PVC coating. A separate bid item for barbed wire was added along with updated barbed wire specifications.

The SUDAS fencing details were updated to closely follow the Iowa DOT's fencing details in the Standard Road Plans. This will not be a shared detail at this time due to minor variations in gate design and fence location with respect to the right-of-way line; however, the review committee anticipates that this could become a shared figure in the future.

– *Section 9070, Landscape Retaining Walls*

This section was re-written to develop a set of retaining wall specifications for short landscape retaining walls with a height of up to 4 feet. These walls do not require a separate structural and geotechnical analysis and design by a licensed professional engineer.

The previous specifications included broken concrete, railroad tie, and combination cast-in-place concrete walls with sidewalk. The broken concrete and railroad tie walls were deleted due to their infrequent construction and un-aesthetically pleasing appearance. The combination concrete sidewalk / wall was moved to Section 9072 since the standard detail allows it to be constructed taller than 4 feet. In addition, the design engineer could provide a special design allowing the wall to be constructed even taller.

New specifications were developed for modular block, limestone, and landscape timber retaining walls.

The term “modular block” was selected to match the Iowa DOT specifications, Section 2430, for walls that typically do not require an engineered design (the DOT requires all segmental or modular block retaining walls to be engineered – even walls shorter than 4 feet). The revised specifications for the modular block walls follow the industry standard ASTM C 1372, but go on to add more stringent requirements for compressive strength, absorption, and freeze-thaw durability. The increased performance requirements, which match the Iowa DOT's specifications, are necessary because it is common for these walls to be installed adjacent to roadways or parking lots where salt spray can affect the long-term durability of the walls. Past experience has shown that standard walls subjected to salt spray can deteriorate quickly. The specifications require that the modular blocks be supplied from an approved Iowa DOT source or system.

Figures for the modular block, landscape timber, and limestone retaining walls were developed. These figures show the typical cross section and installation for each type of wall.

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– *Section 9071, Segmental Block Walls*

This is a new section, and is similar to the Iowa DOT Section 2431 for Segmental Retaining Walls. These walls typically exceed 4 feet in height. Like the Iowa DOT, the SUDAS specifications require a licensed professional engineer to design these walls. This design work is completed either by the wall manufacturer's engineer or by an engineer hired by the contractor after the bid letting. Like the modular block walls, this section follow ASTM C 1372, but imposes additional material requirements to improve long-term performance and durability.

– *Section 9072, Combined Concrete Sidewalk and Retaining Wall*

This specification was pulled out of Section 9070 and developed into a stand-alone section due to the differences in materials and construction compared to a segmental or landscape timber wall. In addition, these walls can be constructed up to 5 feet tall with the standard concrete details included and even taller with a special design provided by the design engineer.

The measurement and payment for this item was changed from a square feet of vertical face basis to a cubic yard basis. Because the sidewalk is an integral part of the structure, and is variable in width, measuring on a cubic yard basis is more appropriate.

The materials and execution section previously referenced Section 7010 (PCC Pavement). The revised specifications were updated to reference Section 6010 (Structures for Sanitary and Storm Sewer) since the work is primarily structural concrete rather than paving work.

– *Section 9080, Concrete Steps, Handrail, and Safety Rail*

This section was updated to address compliance issues with ADA regulations. The materials specifications were updated to reference Section 6010 for structural concrete and the handrail materials were expanded to allow galvanized iron or aluminum in addition to the standard painted iron pipe. A new safety rail specification was developed for use along retaining walls, sidewalks, or other locations where there is a fall risk. The safety rail was designed to meet current building codes.

Project Summary

The SUDAS-Iowa DOT Inconsistencies Review began in 2005 with the Phase 1 (TR-524) study identifying inconsistencies between the Iowa DOT and SUDAS in Divisions 1, 2, 3, 4, 5, 6, 7, and 9 of the SUDAS specifications.

Elimination of these inconsistencies began with the Phase 1 project, continued with Phase 2 (TR-565), and was completed under this third and final phase. With the completion of Phase 3, the specifications and/or figures for 27 of the 49 SUDAS sections were revised. Most of the remaining sections have been revised by SUDAS staff or as part of other projects.

This process has eliminated numerous inconsistencies between the Iowa DOT and SUDAS specifications and resulted in the development of several shared specifications that are nearly identical in content and function. In addition, a number of common SUDAS figures and Iowa DOT Standard Road Plans were developed in cooperation and are (or will be) included in both manuals. This uniformity will ease frustration for both designers and contractors and provide consistency between local and state projects.

Currently, 12 shared specification sections and 47 common figures have been published and are already being utilized by SUDAS and the Iowa DOT. Four additional shared specification sections, and their associated figures, are in the process of being approved and will be published at a future date. Two additional sections have been identified as candidates for sharing in the future. The table on the following page summarizes the status of current, proposed, and future shared SUDAS-Iowa DOT specifications.

While the three phases of the SUDAS-Iowa DOT Inconsistencies Review project resulted in the development of several shared specifications and numerous common figures, the project also established a culture of collaboration and cooperation between the two organizations that will continue into the future. SUDAS and the Iowa DOT continue to work together to ensure their manuals are as clear, concise, and consistent as possible.

Project Summary

Status of Shared SUDAS Specifications and Common Figures

SUDAS Section	Description	Iowa DOT Sections	Shared Spec?	Common Figures? (#)
1010	Definitions	1101	Similar	N/A
1020	Proposal Requirements and Conditions	1102	No	N/A
1030	Approval for Award & Award of Contract	1103	No	N/A
1040	Scope of Work	1104	No	N/A
1050	Control of Work	1105	No	N/A
1060	Control of Materials	1106	No	N/A
1070	Legal Relations & Responsibility to the Public	1107	No	N/A
1080	Prosecution and Progress	1108	No	N/A
1090	Measurement & Payment	1109	No	N/A
2010	Earthwork, Subgrade, & Subbase	2102	No	No
3010	Trench Excavation and Backfill	2552	Yes	Yes (5)
3020	Trenchless Construction	2553	Yes	N/A
4010	Sanitary Sewers	2504	Yes	Yes (3)
4020	Storm Sewers	2503	Yes	Yes (1)
4030	Pipe Culverts	2516 to 2520	No	No
4040	Subdrains and Footing Drain Collectors	2502	No	No
4050	Pipe Rehabilitation	2549	Yes	N/A
4060	Cleaning, Inspection, and Testing of Sewers	2504	Yes	N/A
5010	Water Main, Pipe and Fittings	2554	Yes	Yes (2)
5020	Water Main, Valves, Fire Hyd., & Appurtenances	2554	Yes	Yes (1)
5030	Water Main, Testing and Disinfection	2554	Yes	N/A
6010	Structures for Sanitary and Storm Sewers	2435	Yes	Yes (30)
6020	Rehabilitation of Existing Manholes	2549	Yes	N/A
6030	Cleaning, Inspection, & Testing of Structures	2435	Yes	N/A
7010	Portland Cement Concrete Pavement	2301	No	Yes (4)
7020	Hot Mix Asphalt Pavement	2303	No	Yes (1)
7030	Recreational Trails, Sidewalks, & Driveways	2511 & 2515	No	No
7040	Pavement Repair and Rehabilitation	2212, 2529, 2530, 2541, 2542	No	No
7050	Asphalt Stabilization	N/A	N/A	N/A
7060	Bituminous Seal Coat	2307	No	N/A
7070	Emulsified Asphalt Slurry Seal	2319	No	N/A
Div. 8	Traffic Signals	Not Included in Project		
9010	Seeding	2601	Future	N/A
9020	Sodding	2601	No	N/A
9030	Plant Material and Planting	2610 & 2611	Future	Future (3)
9040	Erosion and Sediment Control	2601 & 2602	No	No
9050	Gabions and Retet Mattresses	2546	Proposed	Proposed (1)
9060	Fencing	2519	No	No
9070	Landscape Retaining Walls	2430	Proposed	Proposed (3)
9071	Segmental Block Retaining Walls	2431	Proposed	N/A
9072	Combined Concrete Sidewalk & Retaining Wall	2516	Proposed	Proposed (1)
9080	Concrete Steps, Handrail, and Safety Rail	2516	No	No
10000	Utility Service Location Details	Not Included in Project		
1110	Demolition	Not Included in Project		

Note: Shaded lines indicate sections with shared specifications, common figures, or both.

Recommendations

This project completes the Inconsistencies study that began nearly five years ago. The project has resulted in significant revisions to both the SUDAS and the Iowa DOT specifications, eliminating numerous conflicts and confusion for designers and contractors. The project also established a process of collaboration between a State DOT and local communities that is unique to the State of Iowa.

It is essential that this attitude of cooperation continue as the Iowa DOT and SUDAS work together to maintain the existing shared specifications and common figures. Without continuous communication, inconsistencies could be re-introduced into the documents, creating confusion for the end-users.

Finally, it is recommended that SUDAS and the Iowa DOT continue to expand their collaborative efforts to develop additional shared specifications and common figures and look to add joint design standards for common areas of design.

