In the United States Court of Federal Claims

No. 02-584C & 03-1548C
(Filed November 22, 2006)

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TRAVELERS CASUALTY AND SURETY OF AMERICA,	*	Contract Disputes Act; *Spearin* implied warranty doctrine; patent and latent ambiguities; duty to inquire; constructive change; equitable adjustment; judgment after trial.
Plaintiff,	*	
v.	*	
THE UNITED STATES,	*	
Defendant.	*	
* *	*	

William A. Scott, Pedersen & Scott, P.C., Charleston, South Carolina; *A. Bright Ariail* and *H. Brewton Hagood*, Rosen, Rosen and Hagood, LLC, Charleston, South Carolina, for the plaintiff.

James M. Meister, Trial Attorney, Commercial Litigation Branch, Civil Division, Department of Justice, with whom were *John Groat*, Trial Attorney, *Peter D. Keisler*, Assistant Attorney General, *David M. Cohen*, Director, and *Brian M. Simkin*, Assistant Director, all of Washington, D.C., for the defendant. *Mark Garrett*, Attorney Advisor, General Law Division, United States Department of Agriculture, Washington, D.C., of counsel.

OPINION AND ORDER

WOLSKI, Judge.

This case arises under the Contract Disputes Act, 41 U.S.C. §§ 601-13 (2000) ("CDA"), out of a contract between the defendant and the plaintiff surety company ("Travelers"). The contract in question concerned the construction of the United States Department of Agriculture's ("USDA's") Vegetable Laboratory in Charleston, South Carolina. The case results from the consolidation of two separate cases brought before this Court -- case number 02-584C, which initially contained a claim for remission of withheld liquidated damages and compensation for additional work performed by a contractor, and was later amended to include equitable adjustment claims of a subcontractor; and case number 03-1548C, which concerned mold remediation. After oral argument was held in November, 2003 on Travelers' motion for partial

summary judgment on its complaint in case number 02-584C, the parties announced to the Court that they had reached agreement in principle on the lion's share of issues presented in the consolidated case. *See* Order (Mar. 31, 2004).[1] The remaining unresolved issues concerned contract disputes involving one of the project's subcontractors, Landscape Pavers, Ltd. ("LPL" or "plaintiff"). Landscape Pavers contended that the USDA's order to remove and replace two paved turn lanes, and portions of two concrete aprons abutting drainage pipes, constituted constructive changes to the contract. It further contended that the government breached the implied warranty of plans and specifications concerning these turn lanes and aprons. A two-day trial was conducted on this facet of the case. After conclusion of the trial, both LPL and the government made thorough closing arguments and submitted post-trial briefs. This opinion comes after a careful consideration of the briefs, oral argument, testimony and other evidence introduced at trial.

I. BACKGROUND

On October 25, 1998, the United States Department of Agriculture put out to bid a contract for the construction of a vegetable laboratory in Charleston, South Carolina. Ex. 2 (Solicitation No. 8255-3K15-99). The contract was originally awarded to Adams Construction Company, Inc. ("Adams") on February 29, 1999. Adams was terminated for default and Travelers assumed the contract under the terms of its performance bond. Travelers, in turn, hired Alcon Associates, Inc. ("Alcon") as general contractor to perform the work required to complete the contract. Landscape Pavers was the subcontractor responsible for paving work related to the vegetable laboratory site, which included roads and parking lots on-site as well as the work at issue in this case.

The vegetable laboratory is located on a site adjacent to U.S. Highway 17. Landscape Pavers constructed several turn lanes to access the lab from Highway 17. One turn lane, for northbound traffic, was built on what had been a grass-covered median at the westernmost portion of the site. This lane crossed over the southbound lane and led to the old entrance to the site. A second turn lane, also for northbound traffic, was built on a median further to the east. This lane also crossed over the southbound lane and led to the new entrance to the site. A third lane, a deceleration lane for southbound traffic on Highway 17, was built on what had been a grass-covered shoulder, and also led into the new entrance. In addition to this work, LPL was to adjust the location of a drainage ditch that ran along the edge of the property, parallel to Highway 17, and to install concrete aprons where the ditch met the flared ends of concrete storm drain piping -- flanking the new entrance to the site. This case concerns the work on the two northbound turn lanes, and the concrete aprons.

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[1] A settlement agreement, which was the predicate to a stipulation to the dismissal of the claims in case number 03-1548C, and the claims, other than LPL's, in case number 02-584C, was executed by the parties on June 28, 2004 and August 2, 2004.

Odell Associates ("Odell") was the design architect and construction manager on the project. Ex. 10 at 7 (Sept. 28, 2000 Hester ltr.). Lockwood Greene was a subcontractor to Odell enlisted to provide design and civil engineering services. Alcon was the general contractor hired by Travelers to complete the project. Def.'s Prop. Findings & Concl. at 2; Pl.'s Post-Trial Br. at 2. Landscape Pavers was Alcon's pavement subcontractor. Def.'s Prop. Findings & Concl. at 2; Pl.'s Post-Trial Br. at 2. Any correspondence from LPL on the project was required to come through Alcon. Ex. 10 at 5 (Oct. 10, 2000 Hogue ltr.).

T. Wayne Hogue, of Odell, was the construction inspections contractor for the project. Transcript ("Tr.") at 724 (Hogue). His responsibilities were to oversee construction on the site and report back to Odell whether the facility and surrounding areas were being built according to specification. *Id*. at 726. He also reported to the government, checked pay applications and responses for information ("RFIs"), and handled correspondence among subcontractors, Odell and the government. *Id*. Richard A. Rogers, of Alcon, was the project manager. *Id*. at 645 (Thul). Arthur B. Schirmer, III, an owner of LPL, was LPL's site construction manager for the USDA project. *Id*. at 35 (Schirmer). Mark Hester was a civil engineer employed by Lockwood Greene. *See id.* at 725 (Hogue). Marva L. Huggins was the USDA contracting officer for the project. *Id*. at 179 (Schirmer). Jeffrey Thul, currently the facility manager of the vegetable lab, was the quality control ("QC") manager of the site for Alcon. Tr. at 641-42 (Thul).

In addition to the contract specifications, *see* Ex. 2 (Solicitation), the paving work was governed by two sets of drawings made by Lockwood Greene. One set, the Contract Drawings, consisted of four site plans (Existing Site & Demolition Plan, Site Layout Plan, Site Grading and Drainage Plan, and Site Underground Utilities Plan, Ex. 1, CV2.1-5.1) drawn to a scale of one inch equaling fifty feet; a sheet explaining the terminology and symbols used and instructing the contractors (Civil Legend, General Notes & Abbreviations, Ex. 1, CV1.1); and four sheets providing site details (Ex. 1, CV6.1-6.4). Because the turn lanes and a portion of the concrete aprons were located in the state highway right-of-way, an Encroachment Permit from the South Carolina Department of Transportation ("SCDOT") was required for the work. This permit, good for one year, was issued on April 11, 2000, and obligated the relevant contractors to follow a set of General Provisions as well as nine Special Provisions. Ex. 3 at 2 (Encroachment Permit). The second set of drawings, also made by Lockwood Greene, was filed with and approved by the SCDOT as a part of the Encroachment Permit application. Four of these were site plans (two Site Layout Plans, Ex. 3, HWY-1 & HWY-5; a Site Grading Plan, Ex. 3, HWY-2; and a Site Utility Plan, Ex. 3, HWY-3) drawn to a scale of one inch equaling eighty feet (except HWY-5, where one inch equals fifty feet); the fifth sheet contained "Miscellaneous Site Sections & Details." *See* Ex. 3, HWY-4. The Encroachment Permit also required the work to comply with SCDOT's "Standard Specifications for Highway Construction." Ex. 3 at 2 (Application ¶ 4), 3 (General Provision No. 10(h)); *see also* Ex. 2 § J, Attach. V ("Specs.") §2301, ¶¶ 1.1, 1.4 (manual referenced in contract specifications).

A. The Turn Lanes

The actual construction of the turn lanes required several steps. First, the sod or upper layer of topsoil had to be removed from the area where the lane was to be installed, exposing the "subgrade" upon which the road would rest. Tr. 61-62 (Schirmer). Next, the subgrade would be "proof rolled" by making "six passes of a minimum 15 ton pneumatic-tired roller." Ex. 2, Specs. § 2301, ¶ 3.2.3.1. Proof rolling is a visual test of the suitability of the subgrade to bear the road, as the tires of the roller (or of a heavily loaded truck) would be observed from behind to see if any bouncing (called "rutting" or "pumping" or "deflection") occurred to indicate depressions in the soil. *See id.*; Tr. at 448 (George); Tr. 112 (Schirmer). The specifications required that proof rolling "shall be done in the presence of the Contracting Officer" and that the contractor give three days' notice prior to proof rolling. Ex. 2, Specs. § 2301, ¶ 3.2.3.1.

The black base, a five inch layer of asphalt, was next placed on top of the subgrade. *See* Tr. at 585-87 (George); Ex. 1, CV3.1; Ex. 3, HWY-1 & HWY-5. This was followed by a two and one-half inch layer of the binder course, and then the top layer, called the "surface" or "wearing" course.[2] Tr. at 586-87 (George); Ex. 1, CV3.1; Ex. 3, HWY-1 & HWY-5. The contract required that the base and the course layers meet American Society of Testing Materials ("ASTM") standards for density. *See* Ex. 2, Specs. §§ 2722, 2742.[3] The contractor was required to provide material samples, density testing results, thickness test results, and smoothness test results to ensure that the base and course layers were properly constructed. *See* Ex. 2, Specs. § 2722, ¶ 3.6; *id.* § 2742, ¶ 3.5. Unevenness in the binder course could not exceed 1/4 inch in 10 feet; unevenness in the wearing course could not exceed 1/8 inch in 10 feet. *Id.* § 2742, ¶ 3.5.2.3.c. The finished grades of each course were required to be within one-half inch of "the finish elevations, profiles, and cross sections indicated . . . ." *Id.* § 2742, ¶ 3.5.2.3.d. The specifications also required that "[f]inal wearing course with a surface texture having undesirable irregularities such as segregation, cavities, pulls or tears, checking, excessive exposure of coarse

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[2] The drawings incorrectly identify the amount of surface course to be applied as 175 pounds per square foot, *see* Ex. 1, CV3.1; Ex. 3, HWY-1 & HWY-5, instead of the 175 pounds per square ***yard*** desired by the SCDOT. Ex. 10 at 2 (Oct. 17, 2000 Hogue ltr.). This layer was about two inches in thickness. *See* Ex. 13 at 3 (July 22, 2000 log). The drawings also state the wrong type of asphalt to be used, as Type 1C is suitable for roads, not the Type T-3 identified on the drawings. *See* Ex. 3 at 2 (SCDOT permit bearing notation "surface course to be Type 1C"); *see also* Tr. at 52-54 (Schirmer); *id.* at 586-87 (George).

[3] Had a layer of soil been added to the subgrade -- known as "fill" -- then the contractor would have been required to submit samples and testing results with respect to the subgrade, including density tests in accordance with ASTM standards to prove that required compaction levels were achieved (a density test had to be submitted for every 18,000 square feet in each layer of fill). Ex. 2, Specs. § 2301, ¶ 3.8.2. No fill was used for the initial construction of the turn lanes. Tr. at 605 (George).

aggregates, sand streaks, indentations, ripples, or lack of uniformity shall be removed and replaced with new materials." *Id*. § 2742, ¶ 3.5.2.3.e.

On Friday, July 21, 2000, LPL began work on the southbound turn lane at the entrance to the facility. *See* Ex. 13 at 2 (log dated July 21, 2000); Tr. at 730-31 (Hogue). Landscape Pavers completed this work over the weekend. *See* Tr. at 730-31 (Hogue); Ex. 13 at 3 (log dated July 22). The northbound turn lane leading to the new entrance was begun on Friday, August 11, 2000, and finished on Monday, August 14, 2000. Ex. 13 at 4-5 (logs). On the following two days, work on the northbound turn lane leading to the old entrance was begun and completed. *Id.* at 6-7 (logs dated Aug. 15 & 16, 2000). The next week, the QC manager sent a notice to comply to LPL, which informed it that inspections of the turn lanes "revealed that this definable feature of work does not comply with the contract documents." Ex. 5 (Notice to Comply No. 15, dated Aug. 21, 2000). Mister Thul explained that "[t]he turn lanes have excessive slope, nonuniform black base and binder courses, numerous areas with undesirable irregularities and a finish grade that does not conform to specification . . . ." *Id.*; *see also* Ex. 2, Specs. § 2742, ¶ 3.5.2.3.d. In addition, Mr. Thul noted that he had not received "documentation that would indicate that the testing requirements in specification section 3.5 Field Quality Control [were] used to monitor the installation of the turning lanes." Ex. 5 (Notice to Comply No. 15). Alcon's notice to comply cited contract specification sections 2722, 2742, 2743, and 2744, as well as contract drawings CV3.1 and CV6.1. *Id.*

A few days later, a representative of the engineering firm working on the project visited the site and wrote a Field Observation Report for the general contractor. Ex. 6 at 3-5 (Sept. 7, 2000 Lockwood Greene report). The report observed that the turn lanes appeared "unfinished," and that:

> The edge of pavement on the median side is not straight (width of lane & taper meanders). The surface of the lane is uneven (rollercoasters) and the asphalt pavement used looked to be binder course material rather than wearing course material. Cross slope on lanes varied and did not match Section 2/CV6.4[.]

Id. at 3. Concerning the northbound turn lane at the old entrance, the report noted "a sharp ridge exists where new pavement abuts the edge of the existing road and needs attention." *Id.* at 4. Two weeks later, this report was forwarded to Alcon by the construction manager, Odell, with a letter stating that the turn lanes "do not meet the specified requirements and are not acceptable." *Id.* at 6 (Sept. 7, 2000 Hogue ltr.). Among the deficiencies noted were the following:

1. The pavement surface is uneven[.]
2. The pavement edges are not straight.
3. The pavement slopes appear to be incorrect.
4. Some areas do not appear to have a finish surface course applied.
5. The soil does not appear to have been properly compacted.

* * *

10. Asphalt is spalling at the edge of the pavement.

* * *

12. Need verification that compaction meets specified requirements and certification that the correct thicknesses of pavement, etc. have been installed. Need copies of test reports on soil compaction, and as required for the asphalt.

* * *

14. There are sunken areas and numerous cracks in the pavement.
15. SCDOT Standards shall be applied to traffic control including barriers until acceptance.

Id. at 6-7.

The Lockwood Greene report and the Odell letter were, in turn, sent to LPL by Alcon on September 8, 2000, with a letter from Mr. Thul requiring a response outlining corrective action by close of business on September 11, 2000. Ex. 6 at 1-2. This letter stated that "[i]n order to avoid any possible injuries that may result from the improper turn lane installation," the government has "requested that the turn lanes be barricaded immediately." *Id.* at 1. Mister Thul emphasized that:

> As stated in the Notice to Comply #15[,] the turn lanes do not comply with the contract documents. Additionally, your company is in noncompliance with the special provision clauses of the encroachment permit. Please refer to special provisions numbered 1, 4, and 18. SCDOT requires that all work is completed immediately. This is not being accomplished on this project.

Id. at 1. The QC manager concluded:

> Inspections of the turn lanes have determined that they were installed incorrectly. Due to the numerous deficiencies that encompass all the turn lanes, I am recommending that the turn lanes be removed and reinstalled. In the interim, your company is to provide safety barricades that will prevent use of the turn lanes until they have been repaired. These barricades must be installed no later than the close of business today.

Id. at 2.

In its response, LPL stated that the "surface course will be leveled and installed uniformly with all edges straightened." Ex. 7 at 1 (Sept. 11, 2000 Schirmer ltr.). Mister Schirmer contended, however, that:

> The SCDOT drawings conveyed to our firm did not show cross-slope elevations or % fall for the median work. The cross-slope elevations were dictated by the

> existing slope of the median area as stated in the Special Provisions section of the Encroachment Permit notes 1 and 4.

Id. In responding to the deficiencies identified by Odell, LPL stated that "[t]he pavement surface will be re-worked and leveled upon clarification of the design deficiencies addressed in this correspondence" -- that is, the lack of cross-slope elevations or slope percentages. *Id.* at 4. Landscape Pavers took the position that "it is apparent the 2% slope as shown on the" southbound deceleration lane section from the HWY drawings "is not applicable" to the northbound turn lanes. *Id.*[4] Concerning the lack of a finish course, LPL responded that "[a]ll asphalt turn lanes have either a Type 1 or a Type 1-C finished course on them." *Id.* at 8.[5] Landscape Pavers asserted that "[t]he soil was compacted and proof-rolled prior to installation of the black base," *id.*, and explained:

> Compaction tests on the asphalt have been performed in the turn lanes and are forthcoming. Soil compaction tests were not performed due to the Special Provisions constraint of note 7. The existing soil was proof-rolled and compacted with a vibratory roller. Certification of thickness can be provided and the information is readily available upon request.

Id. at 9.[6] Landscape Pavers stated that it was "aware of the surface cracking at the turn into the main entrance of the new building, and will make repairs to this area before final acceptance," and that "[t]he 'roller coaster' asphalt will be leveled and topped with T-3 or Type 1-C as specified upon clarification of the application rate and the cross-slope information." *Id.*[7]

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[4] To demonstrate this point, LPL included photographs of the northbound turn lanes at the old and new entrances, showing that a two percent slope from the edge of the existing highway would terminate at an elevation more than two feet higher than the catch basin in the median near the old entrance, and more than one foot higher than the catch basin in the median near the new entrance. *See* Ex. 7 at 5-8.

[5] It appears from the invoices submitted with LPL's CDA claim that "Type 1" may have been the binder course. *See*, *e.g.*, Ex. 53, Tab X at 69-74, 77-78, 81-84, 89-94, 97-99 (Banks Construction invoices). Landscape Pavers does not explain why the surface or wearing course had not yet been installed for portions of a lane or lanes. *See* Ex. 7.

[6] The referenced special provision states that "no excavation shall be left open along highway." Ex. 3 at 4.

[7] As was noted above, *see* note 2, the drawings inaccurately stated the rate of application for the wearing course to be 175 pounds per square *foot* rather than yard. Landscape Pavers asked about this rate in the September 11 letter, *see* Ex. 7 at 10, and later explained that the amount indicated on the drawings would result in a layer that is *15.75 inches* thick. Ex. 9 at 1 (Sept. 22, 2000 Schirmer ltr.).

Landscape Pavers confirmed that "[t]he turn lanes will be closed until all items are completed." *Id.*

By the end of the week, LPL received the general contractor's response. *See* Ex. 8 at 1 (Sept. 15, 2000 Thul ltr.). The engineering firm rejected LPL's contention that the Encroachment Permit's special provisions relating to the slope and contours of shoulder sod dictated the pavement cross slope, and argued that "pavement cross slope is dictated by SCDOT standards," citing "the Highway Design Manual that indicates cross slope to be 48:1 or 2.08%." *Id.* at 3 (Sept. 14, 2000 Hester ltr.). Lockwood Greene also stated that "[n]othing in the contract relieves the requirement for soil testing" and directed LPL to "[p]erform in-place soil density testing." *Id.* at 4. At this time, Alcon demanded that LPL's "response to the SCDOT mandated 2.08% slope for the turn lanes will have to be expeditio[u]s. This definable feature of work must be completed no later than September 29, 2000." *Id.* at 1.

The next week, LPL sent a letter directly to the engineering firm. Ex. 9 (Sept. 22, 2000 Schirmer ltr.). It sought clarification of the amount of surface course to be applied. *See id.* at 1. Landscape Pavers complained that the HWY drawings accompanying the SCDOT permit were a "reduced" size and "incomplete," and that the "full-sized set" of contract drawings were not stamped by an engineer and were incomplete. *Id.* Landscape Pavers also argued that a 2.08% slope for the turn lanes would result in a two foot drop from the edge of the pavement to the drainage structures in the median, which "is not acceptable and will endanger public safety." *Id.* And LPL stated that it "requires the necessary cross-sections for the turn lanes depicting the 2% cross-slope from the existing edge of the asphalt and the required shoulder backfill with clear zone boundary slopes defined to include the elevations of the new location of the drainage swales." *Id.* In this letter, LPL refused "to proceed with any further work in the SCDOT right of way until these errors and omissions are corrected and full-size, stamped drawings with the appropriate cross-sections are transmitted to our office," citing public safety concerns. *Id.* at 2.

Alcon chided LPL for sending a letter directly to Lockwood Greene rather than going through it, the general contractor. Ex. 10 at 1 (Oct. 20, 2000 Rogers ltr.). It also forwarded a response from Odell, which confirmed the proper amount of surface course to be applied, reiterated that the "turn lanes must be at a 2% slope as indicated on the Drawings and per SCDOT Standards," and indicated that the storm drain in the median by the new entrance could be raised to an elevation of 8.39 feet, allowing for a four percent shoulder slope. *Id.* at 2 (Oct. 17, 2000 Hogue ltr.).[8] The next month, Odell, the construction manager, contacted Alcon to request "in-place soil density testing of the soil below the paving in the three new turn lanes." Ex. 12 at 2 (Nov. 3, 2000 Hogue ltr.). Odell stated that if the tests showed the soil was the required density, USDA would pay for them, but otherwise they would be Alcon's responsibility. *Id.* Alcon, in turn, asked LPL to forward the results of such tests, else it would direct them to be conducted and charge LPL. *Id.* at 1 (Nov. 6, 2000 Rogers ltr.). Alcon's QC manager apparently

[8] The contract drawings specified that this storm drain would be at an elevation of 7.8 feet. *See* Ex. 1, CV6.3 (elevation of structure W1).

followed up with a letter to LPL dated November 14, 2000. Landscape Pavers responded with a letter that explained:

> The Contracting Officer was not present during our proof-roll in the right of way. The in-situ soils under the turn lanes was [sic] excavated and compacted by a vibratory roller. After the sub-grade was compacted, a pneumatic roller was driven across the in-situ soils and our supervisors noticed no areas of deflection (please see attached field reports).

Ex. 13 at 1 (Nov. 14, 2000 Schirmer ltr.). A test of the soil under the paved lanes would have required that portions of the asphalt be cut and removed. *See* Tr. at 111-12 (Schirmer). Landscape Pavers stated it would "not accept any responsibility for any destructive testing of the asphaltic concrete paving in the SCDOT right of way or the repairs to the asphalt if such testing should take place." Ex. 13 at 1. It forwarded to Alcon a copy of the daily field logs for the days that work was performed on the lanes, to document the proof rolling that was done. *See id.* at 2-7.

By the end of December, Alcon informed LPL that the turn lane work was "rejected and must be removed and installed correctly and in accordance with plans and specs as outlined in your contract and as directed in" documents forwarded to LPL. Ex. 18 at 1 (Dec. 28, 2000 Rogers ltr.). Alcon was following the recommendations of Lockwood Greene. The engineering firm determined that the pavement slope varied or exceeded the contract requirements for all three turning lanes. *Id.* at 5-6 (Dec. 22, 2000 Hester ltr.) (noting slope of southbound deceleration lane varied from 0.9% to 5.4%; slope of northbound turn lane near new entrance varied from 5.5% to 8.4%; and slope of northbound turn lane into old entrance exceeded requirements); *see also id.* at 7 (engineer's drawings showing slope of 9.4% for northbound turn lane at old entrance). Lockwood Greene also stated that "[f]ield observations indicate longitudinal cracking, depressions, and edge raveling on the pavement." *Id.* at 5. It further noted that Alcon had not supplied "a proofrolling observation report from a geotechnical engineer or soil compaction report for fill areas" under the turn lanes that LPL had constructed. *Id.* Due to these conditions, the engineers concluded:

> Without geotechnical confirmation of proper subgrade conditions prior to pavement placement we cannot determine if construction meets SCDOT and project requirements. Lockwood Greene recommends that the existing pavement be removed, and perform construction (including subgrade modification/confirmation) per SCDOT requirements, specifications, design drawings, and sketches. If Alcon Associates, Inc. can verify that the constructed conditions meet specified subgrade conditions, then alternate methods for corrections may be considered.

Id. Lockwood Greene included a new drawing, designated SKC-D, showing the cross-sections of each northbound lane where the median's storm drain is located, and indicating that the turn lanes were to have a three percent slope at those sections. *Id.* at 7.

Landscape Pavers responded with a letter, from its attorney, denying that its work was deficient, repeating that it believed any order to replace the turn lanes was a change to the contract, and requesting slope and elevation information for the turn lanes. Ex. 19 (Jan. 4, 2001 Hagood ltr.). Landscape Pavers stated it was "willing to perform soil compaction testing to verify proper compaction was achieved . . . at locations selected by the Contracting Officer at a frequency of one per 500 linear feet of turning lane as recommended by SCDOT." *Id.* at 2. The following week, LPL agreed to demolish and remove the two northbound turning lanes, but reminded Alcon that it was still awaiting road and shoulder slope and elevation information before it could install the replacement lanes. *See* Ex. 21 (Jan. 8, 2001 Schirmer ltr.); Ex. 22 at 1 (Jan. 10, 2001 Schirmer ltr.).[9] In particular, LPL questioned whether the northbound turn lanes were to have a three percent cross-slope "at all locations," based on the three percent figure appearing on the SKC-D drawings. Ex. 21 at 1; *see* Ex. 18 at 7 (SKC-D drawing).

Two weeks later, LPL had soil density tests done near the two northbound turn lanes. *See* Ex. 28 at 2-3 (Jan. 23, 2001 test results). Although the asphalt lanes were to have been removed by this time, the tests were not performed on the subgrade that would be below the lanes, but instead within an eighteen-inch buffer zone along the edge of the lanes. *See* Tr. 242 (Schirmer). On February 1, 2001, Odell informed Alcon that "[t]he 3% cross slope of the turn lanes is the maximum slope that we and the SCDOT will accept for these lanes. This is not a change and is to your benefit that this tolerance will be allowed." Ex. 29 at 1 (Feb. 1, 2001 Hogue ltr.). On this basis, LPL reconstructed the two northbound lanes over the next few months. *See* Ex. 52 (June 14, 2001 Schirmer ltr., indicating lanes had been completed "since April 19, 2001").

B. The Concrete Aprons

The initial plans for the site provided that erosion would be controlled on the banks of a ditch running parallel to Highway 17, near the two ends of concrete storm drain piping, through the use of rip rap. The SCDOT required that concrete aprons be used instead of rip rap. Tr. at 193 (Schirmer); Ex. 3, HWY-2 (revision C on drawing indicates change from rip rap to concrete was made on March 29, 2000); Ex. 1, CV4.1 (revision 2 indicating same); Tr. at 761 (Hogue). The site grading drawings provided the location and details concerning these two aprons. *See* Ex. 1, CV4.1; Ex. 3, HWY-2. The aprons were to occupy a rectangular footprint in the ditch, meeting (and covering the top of) the flared end of the concrete storm drain piping. The area to

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[9] These letters indicate that the removal of the northbound lanes was to be started on January 9, 2001, and completed by the end of the day on January 10, 2001. *See* Ex. 21 at 1; Ex. 22 at 1. Mister Schirmer testified at trial, however, that he agreed with a time line showing that the removal of these lanes began on March 29, 2001. Tr. at 221 (Schirmer); *see* Ex. 78 (time line). The claim LPL filed with the Contracting Officer concerning the turn lane replacement appears to contradict the time line, indicating that demolition equipment was used on January 9, 2001, and that trucks hauled asphalt from the site on January 9-11, 2001. *See* Ex. 53, Tab X at 4; *id.* at 147-50 (last four pages behind tab are logs showing asphalt hauled from the vegetable laboratory); *see also* Ex. 54 at 4; *id.* at 147-50.

be covered by each apron was thirty-five feet in length and twenty-six feet in width, and the aprons were to be four inches thick. *See* Ex. 1, CV4.1; Ex. 3, HWY-2. The type of concrete slab and wire mesh to be used were specified, and the drawing directed: "place on uniform slope." *See* Ex. 1, CV4.1; Ex. 3, HWY-2.

In August of 2000, LPL's surveyor staked the four corners of each apron, based on the drawings, and then LPL installed the aprons, basing the elevation of each on the contour lines that intersected the edges of the aprons as depicted on the drawings. Tr. 194-95 (Schirmer). The bottom elevations of the aprons were the elevations of the bottoms of the reinforced concrete pipes to which they were attached. *See* Ex. 1, CV6.3 (indicating height of pipe bottoms V1 and V2 as 2.25 and 1.45); Tr. at 204 (Schirmer); *see also* Tr. at 504-05 (George). Mister Thul, Alcon's quality control manager for the project, was on-site and observed the initial installation of the aprons. Tr. at 685-86 (Thul).

At the end of August, among the photographs taken by Mr. Hogue to inform Lockwood Greene, the engineer, of some alleged problems with the site work was one showing the easternmost apron and ditch, looking to the east. *See* Ex. 80 at 2 (first photo, dated Aug. 31, 2000); *see also* Tr. at 762 (Hogue). Over two months later, Mr. Hester visited the site and noted that he thought the sides to the ditch were too steep. *See* Ex. 81 at 3 (Nov. 8, 2000 Hester Field Observation Report); Ex. 58 at 2 (Jan. 9, 2001 ltr. referencing site visit of Nov. 3, 2000). After engaging a surveyor to review the topography, the engineering firm reported to Odell on December 8, 2000 that the ditch slopes were steeper than the 2:1 and 4:1 slopes it believed the design required. Ex. 58 at 4 (Dec. 8, 2000 Hester fax sheet).

On January 12, 2001, Mr. Thul issued a notice to comply stating, "[i]nspections and surveys have determined that the front drainage ditch, along Hwy. 17 and the accompanied concrete apron is installed incorrectly." *Id.* at 1. The notice described the drainage ditch slopes as "Excessively Steep," and referenced drawings CV4.1, CV6.2, and CV6.4. *Id.* An attached letter from Odell to Alcon, dated January 9, 2001, explained:

> The slopes of the concrete aprons at the storm drain piping at the front entrance to the site are also too steep and have a slope of approximately 1.2:1. The documents require slopes with maximums of 2:1 and 4:1. Please refer to Drawing No. CV4.1

Id. at 2.

Mister W. Mark Adams, LPL's construction manager, responded to the notice to comply on January 16, 2001. Ex. 60. His letter stated:

> We have installed the concrete aprons in accordance with the location of the concrete aprons shown on drawing CV4.1. The concrete aprons [sic] slope and elevations were dictated by the size of the concrete apron and the height of 48

> inch RCP. There are no details provided for the installation of the concrete aprons.

Id. After reviewing this letter, Mr. Hester from Lockwood Greene informed Odell that the aprons did not conform to drawing CV4.1. *See* Ex. 62 (Feb. 1, 2001 Hester ltr.). The engineer's position was that the contours on this drawing "indicate" that the slopes of the easternmost apron should be 2:1 toward the building and 4:1 toward the highway, and the slope of the other apron should be 3:1 toward the highway. *Id.*[10] Mister Hester also wrote that section 2 of drawing CV6.4 "indicates a cross section close to this area that has a 2:1 slope toward the building and a 4:1 slope toward the existing Savannah Highway," which "matches exactly the contours on drawing CV4.1 at the apron." *Id.* He also explained:

> The aprons are located at the main facility entrance, therefore, highly visible from Savannah Highway and will be difficult to maintain grass in the surrounding area. Lockwood Greene recommends removal and replacement of the aprons. To reduce rework slopes designed at 4:1 may be steepened to 3:1 at your option.

Id.

The following week, during a conference call with LPL at which the apron design was discussed, Mr. Hester requested a sketch to support LPL's claim that the aprons would not work using slopes of 2:1 and 4:1. *See* Tr. at 213 (Schirmer); Ex. 68 (letter referencing Feb. 9, 2001 conference call). On February 16, 2001, LPL sent to Odell a sketch which purported to show that an apron of the required dimensions could not reach the top of the storm drain pipe if these slopes were used, and thus would fail to prevent erosion. Ex. 63 at 2. Mister Hester overlooked the information pertaining to the relative height of the apron compared to the piping, and instead understood the sketch as demonstrating that the design would work. He wrote that it "very closely matches the information indicated on the design drawings," and added that he did "not understand why the concrete aprons were not constructed per the drawings or this sketch." Ex. 64 at 4 (Mar. 20, 2001 Hester ltr.). Based on Mr. Hester's conclusion regarding this sketch, Odell, the construction manager, told Alcon, the general contractor, that "[t]his concrete work shall be in accordance with the drawings." *Id.* at 2 (Mar. 26, 2001 Hogue ltr.). Alcon then informed LPL that Odell was "directing you to install this work in accordance with the contract documents or your sketch." *Id.* at 1 (Mar. 29, 2001 Rogers ltr.).

The next week, LPL responded with a letter explaining that "[t]he sketch was provided to show the engineer and the owner's representative that the concrete aprons would not be functional with the given dimensions and slopes," and that "[t]he aprons were installed according to the information provided on the plan view of drawing CV4.1 and located by [LPL's] registered land surveyor." Ex. 65 at 1 (Apr. 5, 2001 Schirmer ltr.). Landscape Pavers informed Alcon that

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[10] No slope for the building side of the westernmost apron was identified in this letter**.** *See* Ex. 62.

it "will not remove and replace the concrete aprons without a change order and monetary compensation for value engineering in drawing the detail . . . ." *Id.* In a subsequent letter, LPL explained how its sketch "clearly demonstrates the elevations on the 48″ RCP and the given dimensions will not work." Ex. 68 at 1 (Apr. 11, 2001 Schirmer ltr.). Landscape Pavers reiterated that it would require a written change order before it removed and replaced the aprons. *Id.*

In late May, 2001, the USDA issued a letter requiring corrective action relating to the concrete aprons to be performed by June 15, 2001. Ex. 69 at 2-4 (May 29, 2001 Huggins ltr.). The contractor was told to "[s]aw cut and remove only the portion of each existing concrete apron that is on the north side of the ditch," to "[r]egrade the north side of the ditch and rework apron area to provide a 2:1 slope," and to "[i]nstall a new concrete apron at 2:1 slope." *Id.* at 2. A sketch depicting the easternmost apron's rework and contours was enclosed. *Id.* at 4. Alcon sent a copy of this "directive" to LPL, and instructed it to "schedule these corrections as soon as possible." *Id.* at 1 (May 31, 2001 Rogers ltr.). Landscape Pavers acknowledged receipt of this order and informed Alcon that it considered this a change to the contract. Ex. 70 (Jun. 4, 2001 Schirmer ltr.). It then removed and replaced the portions of the two aprons in mid-June, 2001, reworking the slope to the 2:1 ratio requested by the government. *See* Tr. at 192 (Schirmer); *see also id.* at 313-14; Ex. 78.

C. Landscape Pavers' Claims Filed with the Contracting Officer

On April 4, 2002, LPL submitted to Alcon two separate claims to be forwarded to the USDA Contracting Officer for the project: a certified claim demanding $146,905 for the removal and reinstallation of the two turn lanes, Ex. 53, and a claim demanding $38,100 for the removal and reinstallation of the concrete aprons. Ex. 71. Travelers filed these two claims with the Contracting Officer on May 20, 2002. *See* Exs. 4 & 6 to Second Am. Compl. Landscape Pavers claimed that "[t]he drawings for installation of the turn lanes are defective as they do not provide cross slope information," Ex. 53 at 1, that the contract "implied that existing grades were to be employed" where turn lanes were replacing the median, *see id.*, and that the order to remove and reinstall the turn lanes following the design information of drawing SKC-D constituted a change to the contract. *Id.* at 2. It also claimed that the contract drawings did "not provide a detail for construction of the concrete aprons," Ex. 71 at 1, and that as a consequence it "used the dimensions of these concrete aprons and adjacent contour lines both found on plan view CV4.1" in order to build the aprons. *Id.* Landscape Pavers argued that the design of the aprons was deficient, that its work conformed to the drawings, and that the order to remove and replace portions of the concrete aprons constituted a change to the contract. *Id.* at 1-2.

The Contracting Officer, Marva L. Huggins, denied both claims on July 19, 2002. Exs. 56 & 75. Concerning the turn lanes claim, the government took the position "that the contract drawings were not defective because the existing elevations were known and the required cross slope was known, which provided adequate information for the deceleration/turn lanes to have been installed correctly." Ex. 56 at 1. The government stated that "[t]he sub grade and paving for the turn lanes were not constructed with the proper cross slopes in accordance with SCDOT

Highway Design Manual or with the contract drawings and specifications (Sections D/CV6.1 and 2/CV6.4)." *Id.* The decision faulted the preparation of the subgrade under the turn lanes, and emphasized: "**No proof rolling observation report by a geotechnical engineer or the soil compaction report for these fill areas in the Savannah Highway has been submitted as required.**" *Id.* The Contracting Officer added that "the paved turn lanes as originally constructed exhibited longitudinal cracking, depressions and edge raveling, which was also unacceptable." *Id.* It was noted that the turn lanes' "slopes were confirmed to range from 0.9% to 8.4% and should have been 2%." *Id.* at 2. The government also pointed out that LPL had not sought additional information or clarifications prior to grading and paving the lanes, although "General Note No. 6 on Drawing CV1.1 states" that contractors were to "[f]ield verify . . . elevations of existing ditches and pavements at tie-in points prior to start of contruction and notify the engineer immediately of any discrepancies." *Id.* Problems with the location of a storm drain, and with the grading and shaping of a median, were also noted. *Id.*

Regarding the second claim, the government took the "position that the information required to construct the concrete aprons is shown on contract Drawings No. CV4.1, Site Grading and Drainage Plan, and Site Section 2/CV6.4." Ex. 75 at 1. It concluded that the elevation contours were found on the former, and the slopes on the latter, as "[t]he specified slopes for the sides of the ditch set the slopes of the concrete aprons, not the size of the concrete apron." *Id.* The government added that LPL failed to request additional information or clarifications before the initial installation of the aprons. *Id.*

After these two LPL claims were denied by USDA, Travelers added them to case number 02-584C, as part of the First Amended Complaint filed on February 27, 2003. *See* First Am. Compl. ¶¶ 21-24, 38-44. A Second Amended Complaint, which added allegations that are not relevant to this trial, *see* Second Am. Compl. ¶¶ 14, 39-40, was filed on March 24, 2004.

II. DISCUSSION

The resolution of this matter involves both questions of law and of fact. Contract interpretation is a question of law. *Calif. Fed. Bank v. United States*, 245 F.3d 1342, 1346 (Fed. Cir. 2001); *Fortec Constructors v. United States*, 760 F.2d 1288, 1291 (Fed. Cir. 1985). Whether a contract contains the implied warranty covering design specifications appears to involve both questions of law, *see White v. Edsall Constr. Co.*, 296 F.3d 1081, 1085 (Fed. Cir. 2002), and of fact. *See Hercules, Inc. v. United States*, 24 F.3d 188, 197-98 (Fed. Cir. 1994) (explaining that, to prevail, plaintiffs "must show . . . that the facts support an implied warranty"). And facts regarding LPL's performance under the contract are, of course, crucial to the determination of its claims. Before turning to the law concerning these subjects, a brief summary of the parties' respective positions is in order.

Landscape Pavers contends that it reasonably followed the design drawings in constructing the turn lanes and aprons, *see* Pl.'s Post-Trial Br. at 2-5, 13-14, 17; that no slope percentages or ratios were specified for the turn lanes and aprons, and that the government is responsible for the consequences of these omissions and defects, *see id.* at 2-3, 6-8, 14, 16-18;

that the construction of the turn lanes was consistent with the obligations imposed by the SCDOT permit, *see id*. at 4, 6; that it complied or offered to comply with all applicable testing requirements of the contract, *see id.* at 8-11; that the turn lanes contained only minor deficiencies, and were prematurely inspected, *see id.* at 5-6, 11; that any defects in the turn lanes could have been corrected with an inexpensive overlay and leveling process, *see id*. at 11, 19; and that the slope percentages and ratios that the government states were required by the design drawings could not have worked at the site, *see id.* at 8, 11, 15. Landscape Pavers called Mr. Schirmer as its fact witness, Tr. at 31-32, and Mr. G. Robert George, a registered professional engineer, as an expert testifying concerning the contract's technical specifications and plans. *See* Tr. at 407-13.

The government contends that the contract requires, expressly and by incorporation, a two percent slope for the turn lanes, *see* Def.'s Prop. Findings & Concl. at 6-7; that contract provisions requiring certain tests, and notice to the government before certain work was performed, were violated, *see id.* at 4-7; that the turn lanes were defectively constructed, *see id.* at 5-8; that the contract drawings specified the slopes for the aprons, *see id.* at 9-10; that LPL violated its obligation to field verify elevations of structures and tie-in points, *see id.* at 9; that the absence of slope information would be a patent omission that LPL was required to raise before proceeding to construct the turn lanes or aprons, *see id.* at 15; that LPL failed to strictly follow the specifications, *see id.* at 16-17; and that LPL had the obligation to perform the work to obtain the correct result, including supplying its own information to fill any gaps. *See id.* at 14-15.[11] The government's fact witnesses were Messrs. Thul and Hogue, *see* Tr. at 641, 721, and Ms. Regina Herchak, who had succeeded Huggins as contracting officer for the contract. *See* Tr. at 614-16.

A. Principles of Contract Interpretation

Government contracts disputes are adjudicated under normal principles of contract interpretation. *See McAbee Constr., Inc. v. United States*, 97 F.3d 1431, 1434-35 (Fed. Cir. 1996); *Gould, Inc. v. United States*, 935 F.2d 1271, 1274 (Fed. Cir. 1991). The purpose of interpreting a contract is, of course, to "accomplish the intention of the parties." *In re Binghamton Bridge*, 70 U.S. (3 Wall.) 51, 74 (1865); *see also Intergraph Corp. v. Intel Corp.*, 241 F.3d 1353, 1354 (Fed. Cir. 2001). The Court will interpret a contract in such a way as to give meaning to all the provisions of the contract in light of the parties' intent at the time they entered the agreement. A contract must be "interpreted so as to harmonize and give meaning to all of its provisions, and [thus] an interpretation which gives a reasonable meaning to all parts will be preferred to one which leaves a portion of it useless, inexplicable, inoperative, void,

[11] The government is inconsistent on this point, arguing pre-trial that the relevant provisions were design specifications, and post-trial insisting they were performance specifications. *Compare* Def.'s Pretrial Mem. at 13 *with* Def.'s Prop. Findings & Concl. at 13-15; *see also* Tr. at 27 (defendant's counsel maintains relevant specifications "were design specifications").

insignificant, meaningless, superfluous, or achieves a weird and whimsical result." *Arizona v. United States*, 216 Ct. Cl. 221, 235-36 (1978); *see also, e.g.*, *Gould, Inc. v. United States*, 935 F.2d 1271, 1274 (Fed. Cir. 1991); *United States v. Johnson Controls, Inc.*, 713 F.2d 1541, 1555 (Fed. Cir. 1983).

The Court will first consider the plain language of the contract's terms. *See, e.g., Forman v. United States*, 329 F.3d 837, 842 (Fed. Cir. 2003); *Gould, Inc.*, 935 F.2d at 1274. If a contract term is clear and unambiguous, the Court will adopt its plain and ordinary meaning. *See, e.g.*, *Moran v. Prather*, 90 U.S. 492, 499 (1874); *McAbee Constr.*, 97 F.3d at 1435; *see also Elden v. United States*, 223 Ct. Cl. 239, 250-253 (1980). "A contract term is unambiguous if there is only one reasonable interpretation." *C. Sanchez and Son, Inc. v. United States*, 6 F.3d 1539, 1544 (Fed. Cir. 1993); *see also Edward R. Marden Corp. v. United States*, 803 F.2d 701, 705 (Fed. Cir. 1986). The plain meaning of a contract term is "the meaning derived from the contract by a reasonably intelligent person acquainted with the contemporary circumstances." *Firestone Tire & Rubber Co. v. United States*, 195 Ct. Cl. 21, 30 (1971); *see also Hol-Gar Mfg. Corp. v. United States*, 169 Ct. Cl. 384, 388 (1965).

If a contract term does not have a plain meaning, it is ambiguous, and the Court must then determine whether the ambiguity is patent or latent. *See L. Rosenman Corp. v. United States*, 182 Ct. Cl. 586, 589-90 (1968); *see also Emerald Isle Elec., Inc. v. United States*, 28 Fed. Cl. 71, 72-73 (1993) (describing the distinction between patent and latent ambiguities in terms of two policies of risk allocation). A patent ambiguity in a contract is one that is, on its face, glaring and obvious. This has been described as encompassing "an obvious omission, inconsistency, or discrepancy of significance," *Beacon Constr. Co. of Mass. v. United States*, 161 Ct. Cl. 1, 7 (1963), or "an obvious error in drafting, a gross discrepancy, or an inadvertent but glaring gap," *WPC Enterprises, Inc. v. United States*, 163 Ct. Cl. 1, 6 (1963). *See also Interstate Gen. Gov't Contractors, Inc. v. Stone*, 980 F.2d 1433, 1434-35 (Fed. Cir. 1992); *Blount Bros. Constr. Co. v. United States*, 171 Ct. Cl. 478, 496-97 (1965). The Court must determine whether a reasonable person would find the ambiguity to be patent and glaring, on an *ad hoc* basis. *L. Rosenman Corp.*, 182 Ct. Cl. at 590; *see also Newsom v. United States*, 230 Ct. Cl. 301, 304 (1982). A contractor may not rely on its own interpretation of patent ambiguities, but instead has a duty to seek a clarification from the government before submitting its bid. *See P.R. Burke Corp. v. United* States, 277 F.3d 1346, 1355 (Fed. Cir. 2002); *Newsom*, 230 Ct. Cl. at 304; *Blount Bros.*, 171 Ct. Cl. at 496. A bidder who does not inquire into a patent ambiguity assumes the risk for any unanticipated costs incurred as a result. *Jamsar, Inc. v. United States*, 194 Ct. Cl. 819, 827 (1971); *Dynamics Corp. of Am. v. United States*, 10 Cl. Ct. 275, 280 (1986).

If not found to be patent, then an ambiguity is latent. The Court will adopt a contractor's reasonable interpretation of a latent ambiguity under the contra proferentem rule -- construing an ambiguity against the drafter. *See Newsom*, 230 Ct. Cl. at 303-04; *Peter Kiewit Sons' Co. v. United States*, 109 Ct. Cl. 390, 418 (1947); *see also United States v. Seckinger*, 397 U.S. 203, 216 (1970). If the contractor's interpretation of such a contract provision is determined to be reasonable, *see P.R. Burke Corp.,* 277 F.3d at 1355-56, the contractor will prevail against the author of the contract. *See, e.g., Underground Const. Co. v. United States*, 16 Cl. Ct. 60, 69

(1988); *Reliable Bldg. Maint. Co. v. United States*, 31 Fed. Cl. 641, 644 (1994) (citing *Newsom*, 230 Ct. Cl. at 303).

In order for this Court to determine whether the contractor's interpretation of the contract provision is reasonable, "the court must put itself in the place of a reasonable and prudent contractor." *Neal & Co. v. United States*, 19 Cl. Ct. 463, 473 (1990), *aff'd*, 945 F.2d 385 (Fed. Cir. 1991). The Court will employ the ordinary meaning of the words used in an agreement unless there is evidence that the parties meant otherwise -- for instance, through the adoption of a special definition. *See Hol-Gar Mfg.*, 169 Ct. Cl. at 390. In interpreting some words, however, "the context and intention [of the parties] are more meaningful than the dictionary definition." *Rice v. United States*, 192 Ct. Cl. 903, 908 (1970)).

B. The Implied Warranty that Specifications are Free From Design Defects

In the world of government contracts, a jurisprudential difference exists between what are known as "design specifications" and "performance specifications." *See* JOHN CIBINIC, JR. ET AL., ADMINISTRATION OF GOVERNMENT CONTRACTS 276-86 (4th ed. 2006). This dichotomy is crucial to the warranty doctrine, enunciated in *Spearin v. United States*, 248 U.S. 132 (1918), which holds that a contractor is not responsible for defects in the item constructed if he strictly follows the design specifications given to him by the government. *Id*. at 136; *see White v. Edsall Constr. Co., Inc.*, 296 F.3d 1081, 1084-85 (Fed. Cir. 2002); *Hercules, Inc. v. United States*, 24 F.3d 188, 197 (Fed. Cir. 1994); *Ordnance Research, Inc. v. United States*, 221 Ct. Cl. 641, 670 (1979); *Hol-Gar Mfg. Corp. v. United States*, 175 Ct. Cl. 518, 525 (1966). As the Supreme Court explained:

> [I]f the contractor is bound to build according to plans and specifications prepared by the owner, the contractor will not be responsible for the consequences of defects in the plans and specifications. This responsibility of the owner is not overcome by the usual clauses requiring builders to visit the site, to check the plans, and to inform themselves of the requirements of the work . . . .

Spearin, 248 U.S. at 136 (internal citations omitted). In *Spearin*, the Supreme Court held that contract provisions "prescribing the character, dimensions and location of" a structure to be constructed "imported a warranty that, if the specifications were complied with, the [structure] would be adequate." *Id.* at 137.

Design specifications dictate the "how" governing a contractor's tasks, in contrast to performance specifications, which concern the "what" that is to be done. Distinguishing design from performance specifications is not always easy, and, indeed, a contract may have more than one type, *see Penguin Indus., Inc. v. United States*, 209 Ct. Cl. 121, 125 (1976), but the precedents have established clear guideposts. The relevant inquiry concerns the quality and quantity of the obligations that the specifications impose. *Mega Constr. Co., Inc. v. United States*, 29 Fed. Cl. 396, 418 (1993). Hence, "detailed measurements, tolerances, materials, i.e., elaborate instructions on how to perform the contract" qualify as design specifications. *Id*.

(quoting *Stuyvesant Dredging Co. v. United States*, 11 Cl. Ct. 853, 860 (1987)). In other words, where the specifications are described in precise detail and permit the contractor no discretion, they are "design." *Dillingham Constr., N.A., Inc. v. United States*, 33 Fed. Cl. 495, 500 (1995). In contrast, where the specifications set forth simply an objective or standard and leave the means of attaining that end to the contractor, they are "performance." *Id*. at 500-01; *see Penguin Indus., Inc.*, 209 Ct. Cl. at 125 (performance specifications leave the manufacturing process to the contractor's "own judgment, experience and know-how"); *see generally Appeal of Monitor Plastics Co.*, ASBCA No. 14447, 72-2 BCA P 9626, 1972 WL 1232 (ASBCA Aug. 3, 1972) (classifying specifications as design, performance, and purchase description). Although the government's plans and specifications need not be paragons of perfection, they must nevertheless be "reasonably accurate." *John McShain, Inc. v. United States*, 188 Ct. Cl. 830, 833 (1969) (quoting *Standard Steel Car Co. v. United States*, 67 Ct. Cl. 445, 472 (1929)).

The *Spearin* implied warranty doctrine has its limits. As was explained above, the warranty does not extend to performance specifications which "merely set forth an objective without specifying the method of obtaining the objective." *White*, 296 F.3d at 1084. Only if design specifications are "so substantially deficient or unworkable as to constitute a breach of the contract" may the contractor recover. *See Wunderlich Contracting Co. v. United States*, 173 Ct. Cl. 180, 191 (1965). Moreover, the contractor must fully comply with and follow the design specifications, although faulty, to enjoy the protections of the implied warranty, unless the departure from the specifications is "entirely irrelevant to the alleged defect." *Al Johnson Constr. Co. v. United States*, 854 F.2d 467, 470 (Fed. Cir. 1988); *see Gulf + Western Precision Eng'g Co. v. United States*, 211 Ct. Cl. 207, 218 (1976); *Sterling Millwrights, Inc. v. United States*, 26 Cl. Ct. 49, 88 (1992). A contractor is subject to a "duty to investigate or inquire about a patent ambiguity, inconsistency, or mistake when the contractor recognized or should have recognized an error in the specifications or drawings." *White*, 296 F.3d at 1085; *see Woodcrest Constr. Co. v. United States*, 187 Ct. Cl. 249, 260 (1969); *Jefferson Constr. Co. v. United States*, 176 Ct. Cl. 1363, 1368-69 (1966); *PBI Elec. Corp. v. United States*, 17 Cl. Ct. 128, 132-33, 135 (1989). And as always, the contractor has the burden to prove the existence and breach of this implied warranty, and the harm that resulted. *Hercules*, 24 F.3d at 197.

III. FINDINGS OF FACT AND CONCLUSIONS OF LAW

A. The Turn Lanes Claim

Landscape Pavers was ordered to remove and replace both turn lanes that it had installed for the northbound traffic of U.S. Highway 17. The turn lanes had uneven surface pavement, with "sunken areas and numerous cracks in the pavement." Ex. 6 at 6 (Sept. 7, 2000 Hogue ltr.); *see also* Ex. 18 at 5 (Dec. 22, 2000 Hester ltr.); Tr. at 736-37 (Hogue). The presence of cracks in the pavement suggested that the soil underneath the asphalt, the subgrade, was not properly compacted. Tr. at 738, 752 (Hogue); *see also* Ex. 6 at 6 ("The soil does not appear to have been properly compacted."). The slopes of these two turn lanes were not uniform. The slope of the easternmost lane, leading to the new entrance, varied from 5.5 percent to 8.4 percent. *See* Ex. 18 at 5. The slope of the turn lane at the old entrance appears to have been 9.4 percent. *See id.* at 7

(SKC-D). Landscape Pavers contends that the government was ordering a change to the contract by requiring a slope of two or three percent for the turn lanes, and that it reasonably followed the government's design specifications in constructing the lanes. It also argues that the subgrade was properly compacted, and that this could have been proven by density tests of the ground alongside the edge of the lanes.

1. Did the Turn Lane Design Include a Specified Slope?

The slope of a highway lane -- which represents how quickly the height of the surface drops as the median or shoulder is approached horizontally -- is an important feature of the highway's design. This tilt in the surface plane causes rain water to run off the highway, reducing the safety hazard posed by hydroplaning. *See* Tr. at 543-44 (George). The turn lanes as initially constructed by LPL had varying slopes, which LPL attributes to a deficient design in the government's drawings. The government, on the other hand, contends that the drawings specified a two percent slope for the turn lanes, and that LPL failed to properly follow the design.

The notice to comply concerning the turn lanes sent by Mr. Thul, the general contractor's QC manager, to LPL stated that the "turn lanes have excessive slope," Ex. 5, and cited, without elaboration, drawings CV3.1 and CV6.1. *Id.* The government's representatives on the project subsequently explained that the cross slopes for the turn lanes should have followed the site section 2 detail from CV6.4, *see* Ex. 6 at 3 (Sept. 7, 2000 Lockwood Greene Field Observation Report), Detail D of CV6.1, *see* Ex. 14 at 1 (Nov. 15, 2000 Hester ltr.), and the "SCDOT standards" as contained in the "Highway Design Manual that indicates cross slope to be 48:1 or 2.08%." *See* Ex. 8 at 3 (Sept. 14, 2000 Hester ltr.); *see also* Ex. 14 at 1. These three alleged sources of the slope information were ultimately cited by the Contracting Officer in denying the CDA claim concerning the turn lanes. *See* Ex. 56 at 1.

A close review of the contract specifications and drawings and the Encroachment Permit, however, reveals that they do not unambiguously dictate a two percent slope for the two northbound turning lanes. Site section 2 from drawing CV6.4 does identify a two percent slope for a turn lane. *See* Ex. 1, CV6.4. The section, though, represents one cut along the southbound turn lane, *see id.*, CV4.1, and is not designated as a "typical" detail that generally applies. *See id.*, CV6.4. Moreover, site section 2 contains features such as the ditch running parallel to the highway, a berm on the facility side of the ditch, and a paved parking area that further undermine the possibility that the details are meant to apply generally to the site. *See id.*

Detail D on drawing CV6.1 also shows asphalt lanes with a slope of two percent. *See id.*, CV6.1. While this detail is designated as "typical," it is specifically described as the "typical asphalt roadway detail," and portrays a two-lane roadway with dirt shoulders along each outer edge. *See id.* It is clear that this detail does not represent any of the turn lanes, which are each adjacent to a two-lane highway and thus involve a total of three paved lanes. *See*, *e.g.*, *id.*, CV3.1. On drawings CV3.1 and CV4.1, Detail D from CV6.1 identifies the two-lane roads that run through the grounds of the facility. *See id.*, CV3.1 (showing the detail at a twenty-four feet wide interior road); *id.* at CV4.1 (showing the detail at three locations along interior road). Other

features of the drawings reinforce the conclusion that this detail is not designed for the turn lanes. On drawing CV3.1, the two-lane asphalt roads in the interior of the facility, including the driveway at the new entrance, are each designated as a "road," in contrast to the turn lanes, which are called either a "left turn lane" or, referring to the southbound one, a "deceleration lane." *See* Ex. 1, CV3.1. Detail D on drawing CV6.1 has its own detail, Detail F of the same drawing, which is designated as the "typical asphalt pavement detail (roadways)." *See id.*, CV6.1. This detail calls for an eight-inch layer of dense graded aggregate base course, covered by a two-inch binder course layer and a two-inch wearing course layer. *Id.* In contrast, the turn lanes employ a five-inch layer of asphalt black base, a two and one-half inch layer of binder course, and a surface course layer expressed in terms of volume weight.[12] Thus, the "typical asphalt roadway detail" contains a number of asphalt lanes, a pavement composition, and a label that are different from those used for the turn lanes -- in other words, there appears to be nothing "typical" about the latter.[13]

The contract and Encroachment Permit do not expressly incorporate the SCDOT "Highway Design Manual," which apparently prescribes a slope of 48:1, or 2.08 percent, when highways are resurfaced. *See* Tr. at 543 (George). A different publication, the SCDOT's "Standard Specifications for Highway Construction," is referenced in the contract specifications. *See* Ex. 2, Section 2301, ¶ 1.1; *see also* Tr. at 446-47 (George) (explaining difference between construction standards manual and design manual). The Encroachment Permit requires compliance with SCDOT's "A Policy for Accommodating Utilities on Highway Rights-of-Way" and the aforementioned "Standard Specifications for Highway Construction," and requires all work to "conform to recognized standards of construction and shall be performed in a workmanlike manner." Ex. 3 at 3 (General Provisions 4 and 10); *see also id.* at 2 (Application ¶ 4). Plaintiff's expert testified convincingly that the "Highway Design Manual" contains standards to be followed by the *engineers* who are designing a highway, and not the contractors who are constructing it. Tr. at 446-47 (George). Moreover, if the design manual and its 2.08% slope were incorporated in the Encroachment Permit then the government, as applicant, would have had no authority to deviate from it. *See* Ex. 3 at 2 (showing Dr. Claude Thomas of USDA as the applicant). Yet the defendant expressly allowed the two northbound turn lanes to be constructed using a three percent slope. *See* Ex. 18 at 5-7 (Dec. 22, 2000 Hester ltr. and SKC-D, ordering a three percent slope); *see also* Ex. 29; Tr. at 793 (Hogue). The Court concludes that the contract and Encroachment Permit cannot reasonably be interpreted as incorporating the SCDOT "Highway Design Manual."

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[12] *See* note 2, *supra*.

[13] A two percent slope for a road appears in one other portion of the contract drawings -- what is designated as "Section 2" on CV6.3, depicting an "entrance roadway section" inside the new entrance to the site, purportedly on CV3.1. *See* Ex. 1, CV6.3. This section appears to be identified mistakenly as Section ***B***/CV3.1/CV6.3, instead of Section ***2***, when depicted on drawing CV3.1. *See id.*, CV3.1. It in any event also concerns an interior roadway and not a stretch of the highway.

The Encroachment Permit required that the lanes, "if and when constructed, shall be installed in accordance with the sketch attached hereto and made a part hereof," Ex. 3 at 2 (Application ¶ 4), referring to the HWY drawings discussed above. *See id.* at 5-9 (HWY-1 through HWY-5). The attached sketches included one containing a section depiction that is nearly identical to Section 2 from CV6.4. *See* Ex. 3, HWY-4, Section 8.[14] As was the case with the contract drawings, except for the two percent slope indicated for the southbound turn lane at this particular section cut, no slope information is provided for the turn lanes. The Court notes that the HWY drawings, which are supposed to contain the relevant information for work inside the SCDOT right-of-way, omit any counterpart to Detail D from CV6.1 -- the "typical asphalt roadway detail" -- which further confirms that this detail concerns only the interior roadways, none of which are within the right-of-way. *See*, *e.g.*, Ex. 1, CV3.1 (showing that right-of-way line is to the south of all interior roads).

The contract and HWY drawings, thus, contain no slope information pertaining specifically to the northbound turn lanes, or to turn lanes in general. Since every place on these drawings where the slope of a paved driving surface is expressed, that slope is given as two percent, *see* Ex. 1, CV6.1 (Detail D), CV6.3 (Section 2), CV6.4 (Section 2); Ex. 3, HWY-4 (Section 8), it would be reasonable to interpret the drawings as implicitly providing for a two percent slope for all of the turn lanes. But it would also be reasonable to conclude, from the absence of slope information for the northbound turn lanes, that the contract drawings did not dictate any particular, uniform slope. This was the conclusion reached by LPL. As Mr. Schirmer testified: "I looked on the plans and did not find a cross slope detail. I looked to [HWY] 1 through 5 in the plans and looked to see the percent slope and cross sections and it was not there." Tr. at 61 (Schirmer). He further explained that he thought he "had enough information to do the southbound deceleration lane, but upon closer inspection, when I got started doing the work itself, I found myself at a loss for information." *Id.* at 97-98 (Schirmer).

What LPL did upon discovering that there was no slope provided for the northbound turn lanes, however, is critical to this claim. Instead of submitting a request for information ("RFI") to the government, through the general contractor, to determine the required slope for the turn lanes, LPL proceeded with the work. *See* Tr. at 660, 684 (Thul); *id*. at 742 (Hogue). Landscape Pavers determined that the slope of the turn lanes was dictated by two special provisions attached to the Encroachment Permit by SCDOT. *See* Tr. at 61-62, 275 (Schirmer); Ex. 7 at 1-2, 4 (Sept. 11, 2000 Schirmer ltr.). These provisions read as follows:

> 1. SHOULDER SOD DESTROYED BY THIS INSTALLATION TO BE REPLACED FOR THE ENTIRE AREA. THE AREA SHALL

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[14] The differences between the two sections are that Section 8 from HWY-4 states that the southbound turn lane meets the shoulder twenty-six feet from the front edge of the ditch bottom (also designated as the right-of-way line), while Section 2 from CV6.4 states that this distance varies; and Section 2 contains northern grid coordinates that are omitted from Section 8. *Compare* Ex.1, CV6.4 *with* Ex. 3, HWY-4.

BE RE-SHAPED AND ROLLED TO THE CROSS SECTION EXISTING PRIOR TO THIS WORK.

* * *

4. THE DITCHES AND/OR SHOULDERS DIST[UR]BED THEI [sic] INSTALLATION SHALL BE RE-ESTABLISHED TO PROPER GRADE, ORIGINAL CROSS SECTION, STABILIZED, AND ALL DRAIN PIPES CLEARED.

Ex. 3 at 4. To LPL, the first provision meant that, when removing the top soil of a grass-covered shoulder in order to lay down the asphalt for a turn lane, "if the shoulder is on a slope, we match that same slope with asphalt." Tr. at 62 (Schirmer). Thus, the turn lanes would have the same slope as the grassy shoulder they replaced. As Mr. Schirmer explained to government counsel:

> To me, Mr. Meister, that actually means that if it's a[n] 18 percent slope existing on the median and you put the asphalt in, it goes back to on or near around an 18 percent slope, to the cross-section that existed before I got there. That's what that means to me.

Id. at 275; *see also id.* at 61 (explaining that slope of turn lane would match shoulder's "existing condition, whether it's a two percent slope or a 15 percent slope"). Following the pre-existing slope of the grass median, then, explains how the two northbound turn lanes were constructed with slopes that, in one case, varied between 5.5 and 8.4 percent and, in the other, was measured to be as great as 9.4 percent. *See* Ex. 18 at 5; *id.* at 7 (SKC-D).

The Court finds this interpretation of the Encroachment Permit to be unreasonable. By their plain language, these provisions apply to "shoulder sod," "ditches," and "shoulders," not paved highway lanes. *See* Ex. 3 at 4. The plaintiff's own expert testified that, in his opinion, these provisions applied not to paved, but to pervious surfaces, and that a turning lane could not be built based on them. Tr. at 430-31, 551-52 (George). Moreover, Mr. George also testified concerning the safety hazard created by large changes in the slope of a highway, explaining that "if you increase over 3 percent, you create a situation where a large truck with a high center of balance, if he changes lanes too quickly, he could flip over." *Id.* at 544. When asked by the Court, the expert agreed that the SCDOT would not want slopes of five or six percent because of the danger posed to trucks. *Id.* Clearly, to interpret the two special provisions as requiring highway turning lanes with dangerous slopes over eight percent, to be used by vehicles exiting a highway that has a slope of 1.67 to 2.08 percent,[15] cannot be considered reasonable.

[15] Mister George testified that the typical slope of highways in South Carolina had been 1:60, but that "when the highway department is resurfacing roadways now, they are going from a design standard of 1 to 60 to a design standard of one to 48." Tr. at 543; *see also id.* at 542.

The ambiguity, then, in the design drawings was not based on the competing interpretations of an implicit two percent slope, on the one hand, and a slope following the contours of the grass shoulder which a lane replaced, on the other; rather, the reasonable alternative to the implicit two percent slope was that no slope information was provided at all. But the cross-slope is a necessary feature in the design of highway lanes. Far from being the random result of such factors as the shape of a grass shoulder, the slope must be steep enough to facilitate water run-off yet not so steep as to create a safety hazard for trucks. *See* Tr. at 543-44 (George). The Court cannot accept the government's argument, *see* Def.'s Prop. Findings & Concl. at 14-15, that the slope, if omitted, constitutes a performance specification detail to be supplied by the contractor. The uncontradicted testimony of LPL's expert, Mr. George, establishes that this detail is a matter for engineers, not paving contractors. *See*, *e.g.*, Tr. at 446-47, 550, 556-57.

But as a matter for engineers, the omission of necessary cross-slope information would be an "obvious void" and a "glaring omission," *see Interwest Constr.*, 29 F.3d at 616, from the perspective of the construction subcontractor. If the two percent slope indicated for other paved areas did not apply to the northbound turn lanes, as LPL contends, then there is no slope at all. The contract is ambiguous as to this detail, since it is "susceptible of two different yet reasonable interpretations, each of which is consistent with the contract language and with the other provisions of the contract." *Lockheed Martin*, 108 F.3d at 322; *see PBI Elec.*, 17 Cl. Ct. at 131. But this ambiguity is patent, "an obvious omission, inconsistency, or discrepancy of significance." *Beacon Constr.*, 161 Ct. Cl. at 7. The absence of slope information was not "hidden" or "subtle." *Cf. Blount Bros.*, 346 F.2d at 968, 973 (finding a latent ambiguity when thirteen of 264 separate drawings had to be scrutinized to interpret provision). When Mr. Schirmer consulted the drawings, he "looked to see the percent slope and cross sections and it was not there," Tr. at 61, and he was then "at a loss for information." *Id.* at 98.

The Court agrees with LPL's position -- which the defendant initially also held, *see* Def.'s Pretrial Mem. at 13 ("The contract drawings and specifications here were design specifications."); *see also* Tr. at 27 -- that the government's drawings regarding the turn lane construction constitute design specifications. Just as in *Spearin*, here the defendant's specifications and drawings prescribed "the character, dimensions and location of" the objects to be constructed. *Spearin*, 248 U.S. at 137. The contract documents "set forth in precise detail the materials to be employed and the manner in which the work was to be performed." *J.L. Simmons Co. v. United States*, 188 Ct. Cl. 684, 689 (1969). Indeed, if the "classic example of 'design' specifications" is described as a plan that a contractor must follow "as one would a road map," *id.*, then one could think of no clearer example of such than the detailed plans for a road itself. But even though the implied warranty that specifications are free from design defects applies to the turn lanes, this "warranty, however, does not eliminate the contractor's duty to investigate or

inquire about a patent ambiguity, inconsistency, or mistake when the contractor recognized or should have recognized an error in the specifications or drawings." *White*, 296 F.3d at 1085.[16]

The missing information concerning the slope of the turn lanes created a patent ambiguity, triggering the duty to inquire. But even though Mr. Schirmer recognized that no cross-slope information for the northbound turn lanes was contained on the drawings, *see*, *e.g.*, Tr. at 61, 93-94, 97-98 (Schirmer), LPL did not raise this lack of information until after it had constructed the lanes, a few weeks after receiving the notice to comply. *See id.* at 97-98; *see also id.* at 660, 684 (Thul); *id*. at 742 (Hogue); Ex. 7.[17] Landscape Pavers cannot rely on the *Spearin* implied warranty, when it failed to inquire about a patent ambiguity. *See White*, 296 F.3d at 1085. These circumstances are somewhat unusual, in that the duty of inquiry typically involves an ambiguity that should have been clarified before bidding on a contract -- in which case the contractor would have understood the greater scope of work required and raised its bid accordingly. *See*, *e.g.*, *Woodcrest Constr. Co.*, 187 Ct. Cl. at 258-60; *Jefferson Constr. Co.*, 176 Ct. Cl. at 1368-70. Here, it would appear that installing turn lanes with a two percent slope, as opposed to a variable slope, would not have required any additional expenditures on the part of the contractor.[18] In other words, the same amount of work would have been involved to do it the way the government wanted as opposed to the way it was done. But this just underscores all the more why fulfilling the duty to inquire was so important -- had LPL just sought the missing information, it would not have had to do the work twice. Landscape Pavers failed to timely seek

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[16] Mister Hogue of Odell, the construction inspections contractor for the government, recommended against Lockwood Greene's responding to LPL's request for more information by providing cross-sections at fifty foot intervals for the turn lanes. *See* Ex. 24. His apparent concern was that this would constitute an admission that insufficient design information was presented in the drawings. *See id*; *see also* Tr. at 789 (Hogue). But such an admission would not establish government liability for a patent omission of information from a design specification, unless LPL satisfied the duty to inquire *before* constructing the turn lanes.

[17] It was not until *after* the turn lanes were initially installed that LPL informed the defendant's representatives on the project that it had "not received a full-sized set of stamped drawings to build the project from," and that contract drawings were "not stamped" by an engineer and were "incomplete." Ex. 9 at 1 (Sept. 22, 2000 Schirmer ltr. to Lockwood Greene). But to the extent that larger, stamped drawings were needed by LPL, this, too, would have been glaring and obvious. *See* Tr. at 487 (George) (plaintiff's expert testifying that "no engineer scale is made" for drawings as small as the HWY ones). Landscape Pavers should have inquired about these omissions prior to constructing the turn lanes.

[18] The existence of a patent ambiguity in the contract documents concerning the slope of the turn lanes moots LPL's contention that the government's allowance of a three percent slope for the re-installed lanes constituted a change to the contract requirements. Had LPL inquired about the slope and been told to install the roads with a two percent slope, and then subsequently found its work rejected on the ground that a slope of less than three percent created a drainage problem, this would, of course, be a completely different matter.

information to resolve this patent ambiguity, and thus, despite the *Spearin* doctrine, may not recover the costs of correcting the turn lanes.[19]

Landscape Pavers argues, however, that even if the slopes of the turn lanes failed to conform to the government's intentions, these could have been corrected in a manner less costly than a complete removal and replacement. *See* Pl.'s Post-Trial Br. at 11, 13, 19. Resolution of this aspect of LPL's claim turns on issues relating to subgrade preparation.

2. Did Concerns about Subgrade Preparation Justify the Removal and Replacement?

In addition to suffering from a varying and excessive slope, the turn lanes as initially installed contained numerous cracks and depressions, *see* Ex. 6 at 6 (Sept. 7, 2000 Hogue ltr.); *see also* Ex. 18 at 5 (Dec. 22, 2000 Hester ltr.); Tr. at 736-37 (Hogue), leading the government to suspect that the subgrade was not properly compacted. *See* Tr. at 738, 752 (Hogue); *see also* Ex. 6 at 6; Ex. 81 at 2 (Nov. 8, 2000 Hester Field Observation Report) ("The cracking indicates that subgrade failure is likely."). Such suspicions could have been avoided had LPL followed a notice requirement of the contract. The contract required proof rolling of subgrade, specifying that it "shall be done in the presence of the Contracting Officer" and that notice of proof rolling be given to the Contracting Officer three days in advance. Ex. 2, Specs. § 2301, ¶ 3.2.3.1. Landscape Pavers complied with this provision when it proof rolled the subgrade for on-site work not within the SCDOT right-of-way -- for the paving of the interior roadways and parking areas. Tr. at 668 (Thul); *id*. at 732 (Hogue). For that particular work, Mr. Thul -- the QC manager for the general contractor -- would receive notice of the intent to proof roll from LPL, and would then, in turn, inform Mr. Hogue of Odell, the government's construction manager for the project. *Id.* at 663-64 (Thul). After receiving notice, Mr. Hogue would then be present to witness the proof rolling, representing the Contracting Officer. *Id.* at 665-66. In addition, although not required by the contract, a geotechnical engineer would also witness the proof rolling and report the results. *Id.* at 666. And even when less than three days' notice was provided by LPL -- sometimes as little as a few hours' notice -- the general contractor was able to arrange for the proof rolling to be witnessed, as Messrs. Hogue and Thul were both on-site. *Id.* at 690-92.

But when LPL proof rolled the subgrade that was to be underneath the turn lanes, a witness representing the Contracting Officer was not present. *See* Ex. 13 at 1 (Nov. 14, 2000 Schirmer ltr.) (conceding that the "Contracting Officer was not present during our proof-roll in

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[19] Landscape Pavers also contends that the slope of the northbound turn lane leading to the new entrance was affected by the presence in the median of storm drain W1, which Mr. Schirmer felt had to be raised by .8 feet for safety reasons. *See* Tr. at 77-84 (Schirmer); *see also* Pl.'s Post-Trial Br. at 11; Ex. 7 at 8. But LPL has things backwards -- the slope of a turn lane should not have been increased to a dangerous percentage merely to accommodate a storm drain; instead, the storm drain should have been adjusted once a lane with a safe slope was installed. *Cf.* Tr. at 544 (George) (discussing slope differentials and vehicle safety).

the right of way"); Tr. at 112 (Schirmer); Pl.'s Post-Trial Br. at 8; *see also* Tr. at 224-25 (Schirmer); Tr. at 733-34 (Hogue). Landscape Pavers did not provide the government's representatives with prior notice that it would be proof rolling these areas. Tr. at 667-68 (Thul); *see also id.* at 731-32 (Hogue).[20] According to Mr. Schirmer, there were several justifications for the failure to provide prior notice of proof rolling. First, since one of the two lanes of the highway in that direction would need to be closed down when LPL worked in the right-of-way, inconveniencing high speed traffic, Mr. Schirmer explained that "you have to schedule your work hourly, and it's not a three-day notification situation." *Id.* at 236 (Schirmer). But this hardly excuses LPL from providing *any* notification, particularly since LPL was also providing to the SCDOT forty-eight hours' advance notice of work in the right-of-way. *See id.* at 60-61 (Schirmer). Second, LPL contends that its work in the right-of-way was in full view of the government's representatives on-site, who could -- and sometimes did -- come out to observe what it was doing. *See id.* at 225, 238. But while this may excuse the lack of notice when the proof rolling is nevertheless observed by the Contracting Officer's representative, this was not the case concerning the turn lanes' subgrade. *See id.* at 225.

The main justification offered by LPL for not providing prior notice of proof rolling for the turn lanes is an interpretation of the contract documents not to apply to work performed within the SCDOT right-of-way. *See*, *e.g.*, Tr. at 67-69, 227-28, 235-36 (Schirmer); *id.* at 524-26 (George). But while it is true that work within the SCDOT right-of-way, for which the encroachment permit was necessary, had to comply with the requirements of the permit, *see* Ex. 3 at 2, this hardly relieves LPL of the need to meet other obligations imposed under the contract. Logic would dictate that any conditions under the permit that were *stricter* than those under the other contract documents would supersede the latter. And it is also reasonable to conclude that certain requirements of the permit, while not in direct conflict with contractual obligations, could have the effect of nullifying those contractual obligations by making them impossible to perform. Neither circumstance applies here, however.[21]

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[20] While Mr. Schirmer testified that he "told [Mr. Thul] we were out there," Tr. at 238, and that LPL "made efforts" to notify the Contracting Officer, *id.* at 291, the Court finds that Mr. Schirmer failed to establish that LPL gave any prior notice of the subgrade proof rolling for the northbound turn lanes. Vague references to the knowledge of Messrs. Thul and Hogue concerning work in the right-of-way are not enough to convince the Court that notice specifically concerning the proof rolling was ever provided by LPL.

[21] Mister Schirmer's testimony concerning the paramount importance of the SCDOT encroachment permit and its attachments, to the exclusion of all other contractual obligations, is undermined by his admission that he had not even seen two of the three pages of special provisions issued with the permit when he initially installed the turn lanes. Tr. at 55-56, 96, 255-56 (Schirmer). Thus, it is clear that LPL proceeded with work even though the encroachment permit on its face identified six special provisions (numbers 18, 28, 30-32, 34) which had not yet been provided to LPL. *See* Ex. 3 at 2, 4.

As was noted above, the government was flexible when it came to the timing of the notification of proof rolling, and was able to have proof rolling observed for the on-site paving when given just a few hours' notice. Tr. at 690-92 (Thul). Thus, even if the traffic control approval came from SCDOT closer than three days to the date of proof rolling, LPL could have notified Mr. Thul so that the proof rolling could be witnessed.[22] The SCDOT encroachment permit incorporated state highway construction standards, including "specifications that refer to how the subgrade is to be prepared." *Id.* at 50 (Schirmer). Landscape Pavers understood the SCDOT to require that subgrade be tested either by proof rolling or by a nuclear density test, and thus believed it satisfied the requirement by performing the former. *See id.* at 64, 109, 226-27; *see also id.* at 524-26 (George). According to LPL's expert, an SCDOT representative need not be present to witness proof rolling. *See id.* at 528 (George). But even if the SCDOT does not require that one of its employees witness proof rolling, the lack of such a requirement hardly prevents LPL from having proof rolling witnessed by a representative of the party for whom the work was being performed. The contract required that the proof rolling be observed, *see* Ex. 2, Specs. § 2301, ¶ 3.2.3.1, and nothing in the encroachment permit nullified this requirement.

Not having witnessed the proof rolling of the subgrade under the turn lanes, and concerned that cracking and depressions suggested improper compaction, the government sought confirmation that compaction was proper. *See* Ex. 6 at 6. One acceptable manner of confirmation would have been an observation report from a geotechnical engineer, following the convention used when proof rolling had previously been performed, on-site. *See* Ex. 14 at 3 (Nov. 15, 2000 Hester ltr.); *see also* Ex. 18 at 5 (Dec. 22, 2000 Hester ltr.). But a geotechnical engineer did not observe this proof rolling. *See id.* at 2 (Dec. 28, 2000 Hogue ltr.); *see also* Tr. at 109 (Schirmer) ("Coastal Engineering did not show up out in the right-of-way to monitor any testing or to perform testing."); *id.* at 291-93 (acknowledging that LPL's geotechnical engineer did not observe the proof rolling). Landscape Pavers instead sent a copy of its own field reports to demonstrate the proof rolling was performed. Ex. 13.

Soil compaction could also have been demonstrated by a soil density test report. *See* Ex. 12 at 2 (Nov. 3, 2000 Hogue ltr.). Had the turn lanes been constructed with fill added to elevate the subgrade, the contract would have required density tests of the fill layer. *See* Ex. 2, Specs. § 2301, ¶¶ 3.6, 3.8.2, 3.8.3. If the subgrade were prepared by cutting -- that is, merely removing a layer of topsoil without the addition of fill -- then no density testing was required. Tr. at 689-90 (Thul); *id.* at 746-47 (Hogue). Since no fill was used in the initial installation of the turn lanes, no density test of the subgrade was taken. *See id.* at 605 (George). Although prior density tests of the subgrade, thus, were not required, the government subsequently requested them. *See* Ex. 12 at 2. Odell, the construction manager, informed Alcon, the general contractor, that it was requiring "in-place soil density testing of the soil below the paving in the three new turn lanes."

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[22] No reason was provided by LPL why notice to the SCDOT of work in the right-of-way could not have been given *more* than forty-eight hours in advance, and the Court concludes it would have been possible under the circumstances for LPL to provide three days' notice of proof rolling to the Contracting Officer.

Id. This request was passed along to LPL. *Id.* at 1 (Nov. 6, 2000 Rogers ltr.). The government was within its rights to require density tests. Among the clauses incorporated by reference into the contract was the "Inspection of Construction" clause of the FAR, 48 C.F.R. § 52.246-12. *See* Ex. 2 (Solicitation § E.1). This clause provides:

> If, before acceptance of the entire work, the Government decides to examine already completed work by removing it or tearing it out, the Contractor, on request, shall promptly furnish all necessary facilities, labor, and material. If the work is found to defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray the expenses of the examination and of satisfactory reconstruction. However, if the work is found to meet contract requirements, the Contracting Officer shall make an equitable adjustment for the additional services involved in the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.

48 C.F.R. § 52.246-12(h). The government, suspecting that the subsoil was not properly compacted, and not having witnessed the proof rolling, requested testing under this clause. *See* Tr. at 623 (Herchak). Odell informed Alcon that, "[a]s per the Contract, if the test results indicate the soil density is as specified, the USDA will pay for the tests . . . ." Ex. 12 at 2 (Nov. 3, 2000 Hogue ltr.).

Even though the costs of the testing would be reimbursed if the tests supported LPL's claim that the subgrade was properly compacted, LPL refused to prepare the subgrade for these tests, stating it "does not accept any responsibility for any destructive testing of the asphaltic concrete paving in the SCDOT right of way or the repairs to the asphalt if such testing should take place." Ex. 13 at 1 (Nov. 14, 2000 Schirmer ltr.). As a result, the soil below the northbound turn lanes was never subject to density testing. *See* Tr. at 242, 246-47 (Schirmer). More than two months later, on January 23, 2001 -- after LPL had agreed to demolish and remove the two northbound turn lanes -- density testing was performed on the soil adjacent to these turn lanes, in three locations. *See id.* at 109, 241-42; Ex. 28.[23] Landscape Pavers contends that a test of the subgrade compaction within eighteen inches of the edge of the turn lanes is the equivalent of testing the subgrade below the turn lanes, because the SCDOT requires, in its Standard Specifications for Highway Construction, that "[t]he subgrade between lines 18 inches outside the area to be occupied by the pavement structure shall be compacted to not less than 95% of maximum density." Ex. 35 at 2 (Hwy. Specification § 208.02); *see* Tr. at 137-38, 242-47, 302

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[23] As was noted above, evidence in the record suggests that the two turn lanes were actually removed between January 9 and 11, 2001. *See* note 9, *supra*. But regardless of whether the paved turn lanes were still there, or had been removed and replaced with backfill to prevent a drop-off from the edge of the existing highway lanes, it is not disputed that LPL's soil engineers performed the density tests in the dirt shoulder adjacent to the area to be occupied by the turn lanes.

(Schirmer). Mister Schirmer explained that the SCDOT provision "is clearly a 'more stringent' specification than the project specification," and thus concluded that results of density tests within eighteen inches of the edge of the pavement "reflect a compliance with the project requirements for compaction under asphalt paving areas." Ex. 35 at 1 (Apr. 6, 2001 Schirmer ltr.).

Landscape Pavers is correct that the SCDOT specification is more stringent than the express specifications of the contract. The latter required density tests of the subgrade under roadways only when fill or backfill was used, and density tests of the subgrade of a cut area only under building slabs, steps, parking lots, footings, sidewalks, and grass areas. *See* Ex. 2, Specs. § 2301, ¶ 3.6. Moreover, the contract specifications generally require density testing of compacted subgrade that will be *under* certain areas, rather than within eighteen inches of them. *See id.*[24] The SCDOT specification clearly requires that the subgrade below a highway lane and within eighteen inches on either side of the lane must be compacted to a certain density. As LPL acknowledged, the purpose of compacting the subgrade alongside the lane is to provide lateral support for the lane. Tr. at 244-45 (Schirmer). Landscape Pavers turns logic on its head, however, by insisting that, because the specification requires the eighteen-inch wide buffer zone to be as compacted as the subgrade below a turn lane, testing of the density of the buffer zone will confirm that the subgrade below the lane was properly compacted. *See id.* at 242-44, 320, 324-25 (Schirmer).

Landscape Pavers' expert, Mr. George, did provide a reason why testing of the adjacent soil could be sufficient. He testified that in his opinion -- as someone with decades of experience with proof rolling -- it is likely that density will increase as one nears the center of a compacted area, because the compacting vehicle will have repeated more passes over that area than over the edges. Tr. at 535 (George). And Mr. Schirmer explained why the SCDOT might not strictly require the testing to be of the subgrade that is to be below a paved lane, when time constraints and safety considerations would not allow this testing. *Id.* at 287-90 (Schirmer).[25] Neither Mr. Schirmer nor Mr. George, however, would go so far as to testify that their *experience* has been that the SCDOT *has accepted* density tests alongside a paved lane as proof of the compaction of the subgrade underneath the lane -- instead, they based this view on their interpretation of the SCDOT specification. *See*, *e.g.*, *id.* at 137-38, 242-47, 294-95, 302, 319-20 (Schirmer); *id.* at 532-34, 597, 602 (George).

The Court does not think it is reasonable to interpret the SCDOT provision to mean anything other than that work may be rejected if the area within eighteen inches of a paved lane is

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[24] The one exception concerns compacted general fill and general backfill that are "besides structures." Ex. 2, Specs. § 2301, ¶ 3.6, Table III.

[25] The policy of "pave first, test subgrade later" seems implausible due to its serious downside, as it would require pavement to be demolished and removed when the tests reveal improper compaction. This waste would be avoided by testing the unpaved subgrade first.

not properly compacted, just as would be the case if the subgrade directly beneath the lane were not properly compacted. But in any event, even if LPL is right in opining that the SCDOT would accept testing within eighteen inches of the paved lane to prove compaction under the lane, this does not prevent the government, in exercising its rights under the "Inspection of Construction" clause, from requiring testing of the subgrade below the paved lane -- particularly where, as here, the condition of the pavement suggests improper compaction.

Landscape Pavers points out that the government ultimately accepted testing of the soil within eighteen inches of the southbound turn lane as confirmation of the compaction of that lane's subgrade. Pl.'s Post-Trial Br. at 10-11; *see* Tr. at 137-39 (Schirmer); *id*. at 452-53 (George), 693 (Thul), 782 (Hogue); Exs. 35 & 52. As a result, rather than tearing out and replacing the southbound lane, LPL was permitted to re-work the lane to a three percent slope by milling and leveling and placing an overlay of asphalt. *See* Tr. at 69-70 (Schirmer), 693 (Thul), 782 (Hogue). Landscape Pavers thus concludes that it should have been given the same opportunity to correct the northbound turn lanes, since density tests along the edge of the lanes showed the proper compaction. But the evidence indicates that the southbound lane was not as deficient as the other two. The latter exhibited cracks and ragged areas, *see* Tr. at 752-53 (Hogue), and the slopes of the former -- varying from 0.9% to 5.4%, *see* Ex. 18 at 5 -- was much closer to the slope desired than the northbound lanes as initially installed. *See id*. at 5-7 (noting slopes of one lane varied from 5.5% to 8.4% and slope of other reached 9.4%). Thus, the government's willingness to accept corrective work on a smaller scale on the southbound lane does not constitute a waiver or admission regarding the suitability of density testing alongside the paved lanes. The Court concludes that since the government neither witnessed the proof rolling nor received from LPL the results of density tests of the subgrade beneath the northbound turn lanes, it was reasonable for the government to insist on the removal and replacement of the two lanes. The possibility that the subgrade was not properly compacted -- a suspicion that would have been avoided or dispelled had LPL proof rolled the subgrade in the presence of the Contracting Officer's representative or performed tests that confirmed the compaction (at the government's expense) -- justified the government's rejection of the two lanes.[26]

[26] Landscape Pavers also contends that the turn lanes were prematurely inspected, *see* Pl.'s Post-Trial Br. at 5-6, as one of the lanes "was lacking the finished course on it." Tr. at 74 (Schirmer). But this would hardly explain why all three lanes were found defective, nor has LPL explained why one lane was left in an unfinished state. Landscape Pavers seemed to suggest that the erroneous rate of application identified for the surface course, *see* note 2, *supra*, was responsible for delaying completion of this work. *See* Ex. 7 at 10. But even if this were the case, the confusion stemmed from LPL's failure to timely inquire as to this obvious error, *see* note 7, *supra*, and thus cannot excuse LPL from the required rework. Moreover, the uneven state of a lane lacking the finished course was itself a deficiency. *See* Ex. 2, Specs. § 2742, ¶3.5.2.3.c.

B. The Concrete Aprons Claim

When LPL initially installed the erosion-controlling concrete aprons at the two ends of concrete storm drain piping that runs below the new entrance to the facility, the slope of the aprons on the side closest to the highway was steeper than 4:1, and on the side closest to the facility was steeper than 2:1. *See* Ex. 58 at 2 (Jan. 9, 2001 Hogue ltr.), 4 (Dec, 8, 2000 Hester ltr.); Tr. at 303-04 (Schirmer). The government determined that these slopes violated the design requirements of the contract, and ordered LPL to remove the portions of the aprons protecting the facility (north) side of the ditch; to regrade the north side of the ditch to create a 2:1 slope; and then to install a new concrete apron at a 2:1 slope on the north side of the ditch. Ex. 69 at 2 (May 29, 2001 Huggins ltr.). Landscape Pavers contests the government's claim that the contract drawings required a 2:1 slope for these portions of the aprons, and contends that it reasonably followed the drawings when initially installing the aprons.

1. Did the Concrete Apron Design Require a 2:1 Slope?

The basis of the notice to comply and of the government's order of corrective action concerning the concrete aprons was an interpretation of the drawings to require a 2:1 slope (two feet of horizontal distance for every one foot vertical drop) for the aprons on the north side of the ditch. *See* Ex. 58 at 2 (Jan. 9, 2001 Hogue ltr.), 4 (Dec. 8, 2000 Hester ltr.); Ex. 69 at 2. Mister Thul's notice to comply cited, without elaboration, drawings CV4.1, CV6.2, and CV6.4, and referenced a letter from Odell which cited, without explanation, drawing CV4.1 as the source of the aprons' slopes. *See* Ex. 58 at 1 (Jan. 12, 2001 Notice to Comply); *id.* at 2 (Jan. 9, 2001 Hogue ltr.). The government's design engineer for the project believed that "Drawing CV4.1 is very clear concerning the elevations of the concrete aprons," explaining that contours on this drawing "indicate" a "2:1 slope toward the building side" for the easternmost apron. Ex. 62 at 1 (Feb. 1, 2001 Hester ltr.). This clarity apparently did not extend to the westernmost apron, as Mr. Hester did not identify a slope for the north side of that apron based on the contours of CV4.1. *See id.* Mister Hester also cited Section 2 of drawing CV6.4 to corroborate his slope calculation, stating this section "indicates a cross section close to this area that has a 2:1 slope toward the building and a 4:1 slope toward the" highway, which he claimed "matches exactly the contours on drawing CV4.1 at the apron." *Id.*

In rejecting LPL's CDA claim for reworking the concrete aprons, the Contracting Officer stated that the concrete aprons' "slopes are indicated on" Section 2 of CV6.4, as "[t]he specified slopes for the sides of the ditch set the slopes of the concrete aprons, not the size of the concrete apron[s]." Ex. 75 at 1. She concluded, with emphasis, that "[t]he uniform slopes indicated in the drawings correspond to the slopes shown on sheet CV6.4, Section 2, and it was clear that the drainage ditch slopes installed **did not meet the contractual requirements outlined on sheet CV6.4, Site Section 2.**" *Id.* Landscape Pavers, for its part, contends that it followed the drawings in building the aprons. *See* Tr. at 194-95, 203-04, 305-06 (Schirmer). The aprons were installed in the footprint indicated on CV4.1 and HWY-2, as LPL's surveyor staked the corners at the required locations and elevations. *See id.* at 193-95. The slopes of the north and south sides of the aprons were the natural result of the aprons' straight descent from the upper elevation

to the pipe bottoms that the aprons were designed to surround. *See id.* at 204. On the north side, these slopes ended up being steeper than 2:1. *See id.* at 303-04.

Reviewing the drawings, it is clear that the government's interpretation of a 2:1 slope requirement cannot apply to the north side of the westernmost apron. The contour lines which allegedly indicate the 2:1 slope are a solid line showing a five foot elevation along the north edge of the easternmost apron, and another solid line showing a two foot elevation roughly 6.25 feet from this edge, running parallel to the north edge until the flared end of the piping is reached. *See* Ex. 1, CV4.1.[27] The westernmost apron, attached to the storm drain piping end identified as V1, has no counterpart to these lines. The contour lines which run through the westernmost apron do not run parallel along the northern edge nor do they intersect the end of the piping. *See id*. These contour lines would not dictate a slope for the northern side of this apron. Tellingly, the design engineer, in his letter explaining how the apron slopes were derived, claimed that the contours of CV4.1 indicated slopes for the highway side, facility side, and piping end side of the eastern apron -- but only for the highway and piping end side of the western apron, *not the facility (north) side*. *See* Ex. 62 at 1 (Feb. 1, 2001 Hester ltr.). The government also bases its 2:1 slope requirement on site section 2 of drawing CV6.4, which, as was discussed above, represents a particular cut alongside the southbound turn lane. *See* Ex. 1, CV6.4. This site section shows that LPL was to reshape the drainage ditch running parallel to the highway so that it was moved slightly to the north, with a resulting slope that "varies" on the facility side but was to be no steeper than two feet in horizontal distance for every one foot in vertical distance. *Id.*; *see also* Ex. 1, CV4.1. But this work, which accounts for proposed contour lines running parallel to the highway on drawing CV4.1, does not carry over to the other side of the entrance. No similar contour lines representing a reshaped ditch are found on the western apron side of the new entrance to the facility. *See* Ex. 1, CV4.1. Regardless of their application to the eastern apron, the drainage ditch contour lines and the slope from Section 2/CV6.4 have nothing to do with the western apron.[28]

The more difficult question, though, is how these ditch contour lines and slopes bear on the design of the eastern apron. Looking first at site section 2 of drawing CV6.4, this detail shows the cut at one location along the southbound turn lane.[29] Depicted is the twelve-foot wide turn lane, an eight-foot wide shoulder, and then a ditch that is of variable width. Ex. 1, CV6.4. The ditch required some earth work, as it is depicted as starting at a higher elevation than

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[27] The solid contour lines represent the areas of equal elevation proposed in the drawings, which are to result from the site work. *See* Ex. 1, CV1.1

[28] Moreover, if the slopes shown in Section 2 of CV6.4 for the ditch sides were to apply to the western apron, the slope of the highway side of the western apron would be 4:1. But Mr. Hester had calculated this slope to be 3:1, based on the contours shown on drawing CV4.1. *See* Ex. 62 at 1.

[29] This location is found one hundred feet from the beginning of the eastern concrete apron. *See* Ex. 1, CV4.1; *see also* Tr. at 309 (Schirmer); *id.* at 494 (George).

previously existed at the site; dropping and rising more gradually than the previously-existing ditch; and having a trough that is moved to the north of its prior location. *See id.* The highway side of the ditch is given a 4:1 slope; the trough of the ditch appears to be level, is of variable width, and was to be at the same elevation of the previously-existing ditch bottom; and the slope from the trough upwards towards the facility is shown as variable, with a maximum slope of 2:1. *Id.* The facility side of the ditch terminates at a berm that is given the elevation of 9.55 feet, and has an absolute northern grid location, between 10238.84 and 10240.84. *Id.* This detail could not have been drawn with concrete aprons specifically in mind, as drawing CV6.4 was last revised on February 1, 2000, and signed and stamped by Mr. Hester on February 15, 2000. *See id.* But it was not until March 29, 2000 that the Site Grading and Drainage Plan, drawing CV4.1, was revised to replace rip rap with concrete aprons to control erosion near storm drain piping outlets V1 and V2. *See* Ex. 1, CV4.1.

Landscape Pavers was required to follow the Encroachment Permit and its drawings for work in the SCDOT right-of-way. *See* Ex. 3 at 2. Portions of the concrete aprons fell within the right-of-way, *see*, *e.g.*, *id.* at 5 (HWY-1, showing right-of-way line bisecting lower quarter of eastern apron and upper quarter of western apron); Ex. 1, CV4.1 (same), and the SCDOT allowed LPL to close the shoulder of the highway when installing the aprons. *See* Tr. at 192 (Schirmer). The HWY drawings contain a counterpart to Section 2, which is site section 8 of HWY-4. *See* Ex. 3, HWY-4. Section 8 differs from Section 2 in a couple of particulars. First, it shows that the front edge (on the highway side) of the ditch trough intersects with the right-of-way line, which is twenty-six feet from the edge of the turn lane. *See id.* This creates an internal inconsistency, as the distance between the right-of-way line and the edge of the shoulder is denoted as "varies," yet it obviously must be eighteen feet. *See id.* Also, Section 8 omits a detail included in Section 2, as the berm is not given a fixed grid location. *Compare* Ex. 3, HWY-4, Section 8 *with* Ex. 1, CV6.4 (Section 2). Although HWY-4 was issued after the change from rip rap to concrete aprons was made, these differences relative to Section 2 do not appear to be driven by the need to accommodate the new erosion structures, as the aprons are not referenced at all. *See* Ex. 3, HWY-4. Moreover, these slight changes seem, if anything, to be erroneous. The berm north of the ditch has not changed in location, and is still parallel to the north grid lines. *See id.* at 6 (HWY-2). And the right-of-way line runs between the new five feet and two feet contour lines, south of the storm drain piping endpoint V2, and thus is not the ditch bottom and could hardly serve as such. *See id.*; *see also* Tr. at 510-11 (George).

Focusing, then, on Section 2 of drawing CV6.4, this appeared to direct LPL to construct a new ditch that has a straight 4:1 slope on the highway side, beginning at the edge of the shoulder and bottoming out when the depth of the existing ditch bottom is reached, and then rising no steeper than a 2:1 slope until the berm is reached. *See* Ex. 1, CV6.4. Thus, there were two fixed reference points -- the edge of the shoulder, which is twenty feet from the edge of the pre-existing Highway 17 pavement, and the berm. Reviewing the contour lines on CV4.1 confirms that the existing ditch was to be moved to the north. According to section 2, the north slope of the ditch is to be no steeper than 2:1, and "varies" along the ditch. *Id.* The slope of this side will necessarily be determined by two variables -- the depth of the ditch and the point at which the ditch begins to rise toward the facility. The deeper the ditch bottom, the farther north the trough

begins, given the fixed 4:1 slope on the south side. But the farther north the ditch bottom is located, the narrower this bottom must be, because the berm is nearer to the ditch bottom, making the slope of facility side of the ditch steeper. That the northern slope of the ditch varies at all makes Section 2 incompatible with the design of the aprons, as the apron description states "place on uniform slope." *See*, *e.g.*, Ex. 1, CV4.1. On the other hand, a varying slope would have posed no difficulty to the original design using rip rap to control erosion, as this device is, basically, just a pile of rocks. *See* Ex. 2, Specs. § 2630, ¶ 2.5.

At the eastern concrete apron, in addition to the existing edge of pavement and the berm, an additional fixed feature comes into play -- the storm drain piping. The end of the pipe, structure V2, is given a precise location and elevation. *See* Ex. 1, CV6.3 (providing a north and east grid location and an elevation of 1.45 feet). The flared end of the pipe has the fixed width of seven feet. *See* Tr. at 202-03, 205-06 (Schirmer); *see also* Ex. 61 (pipe manufacturer's table and drawings showing that pipe with a forty-eight inch diameter has an eighty-four inch width at the base of the flared end). Referencing these fixed points, LPL's expert demonstrated that the ditch slopes identified in Section 2 could not work for the eastern apron. *See* Tr. at 504-05, 569 (George).[30] If, as shown on CV4.1, the north and south edges of the concrete apron are at an elevation of five feet, and the highway side of apron slopes at a rate of 4:1 (four feet horizontal per every foot vertical), to reach the 1.45 foot elevation of the bottom of the drain pipe end would require 14.2 feet of horizontal distance (the 3.55 foot drop multiplied by four). To rise back to a five foot elevation at no greater than a 2:1 slope would require another 7.1 feet in horizontal distance (the 3.55 foot rise multiplied by two). But taking into consideration the seven foot width of the storm drain piping, only 4.8 feet of horizontal distance remains within the twenty-six foot footprint of the apron. Or, put another way, to drop from a five foot elevation to a 1.45 foot elevation at a 4:1 slope, cover a flat seven-foot distance, and then rise back to a five foot elevation at a 2:1 slope requires 28.3 feet of horizontal distance -- but the footprint of the apron is only twenty-six feet across. *See* Tr. at 569 (George). Thus, the slope information for the drainage ditch depicted in Section 2 of drawing CV6.4 cannot be used to construct a concrete apron of the dimensions and elevations required. Since Section 2 does not contain any reference to concrete aprons, it was reasonable for LPL to conclude that it did not apply to the aprons.

Nor would following the contour lines of drawing CV4.1 result in a functional concrete apron. The horizontal distances between the five foot contours that run along the outer edges of the eastern concrete apron and the two foot contours that skirt the edge of piping end V2, roughly

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[30] Mister George first demonstrated that at the location where site section 2 is found on CV4.1, it was not possible to construct a ditch with the prescribed slopes. Tr. at 498-504 (George). Starting from the existing edge of the pavement, and working north, Mr. George showed that, assuming the ditch bottom was the same width as the end of the drain pipe, the slope of the north side of the ditch could be no flatter than 1.63:1. *Id.* at 501-04.

12.5 feet on the highway side and 6.25 feet on the building side,[31] would accommodate slopes of 4:1 and 2:1, respectively. The problem, though, is this would hit the end of the drain piping at an elevation of two feet, which is .55 feet above the bottom of the pipe. *See* Ex.1, CV6.3. But the purpose of the apron is to prevent erosion from occurring around the end of the pipe, not to impede the flow of water through the pipe. The two foot contour line conflicts with the elevation of V2 and must, therefore, not have any relevance to the construction of the apron.[32]

Thus, contrary to the government's position, neither site section 2 of CV6.4 nor the contours found on drawing CV4.1 dictate the slope of the concrete aprons. Indeed, in order to enable LPL to reconstruct the north side of the eastern apron using a 2:1 slope, the government allowed the berm to be moved north of the location dictated by the drawings. *See* Tr. at 802 (Hogue); *id.* at 512-13 (George). Landscape Pavers followed the design drawings when it initially installed the concrete aprons. The slopes of the aprons' sides were the natural result of the elevations of the slope corners and the pipe bottoms. The government ordered LPL to remove the northern sides of the these aprons, to regrade the ditch slope, and then replace the aprons on a 2:1 slope. Ex. 69 at 2 (May 29, 2001 Huggins ltr.). The only remaining questions, in determining whether this was a constructive change to the contract requiring an equitable adjustment, concern the specifications' type, and whether the lack of slope information was a patent ambiguity.

Landscape Pavers contends that the drawings relating to the construction of the concrete aprons constituted design specifications, which it reasonably followed. Pl.'s Post-Trial Br. at 16-17. Thus, LPL argues that if the government found the resulting aprons to be defective, the government is responsible under the *Spearin* implied warranty. *Id.* The government contends that if slope detail for the aprons were missing from the specifications, then this aspect of the contract either constituted performance specifications requiring that LPL "itself generate detail," or amounted to a patent ambiguity triggering LPL's duty to inquire. Def.'s Proposed Findings & Concl. at 14-15. The Court concludes that the relevant drawings were design specifications. Both CV4.1 and HWY-2 provide detailed instructions regarding the concrete aprons. *See* Ex. 1, CV4.1; Ex. 3, HWY-2. The exact dimensions of the footprint occupied by the aprons are given, as well as the thickness of the aprons. The type of concrete and wire mesh to be used in constructing the aprons is also provided. The location of the aprons is shown, as well as a few elevation points. And another drawing, CV6.3, describes the precise location and elevation of

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[31] This calculation is rough because the contract drawings used a scale -- one inch equaling fifty feet -- which appears to be too small for use in this type of construction. Site plans would normally employ a scale where one inch equals twenty or thirty feet. Tr. at 212 (Schirmer); *id.* at 454 (George). For detailed work, a scale where one inch equals ten feet is desirable. *See* Tr. at 454 (George); *see also id.* at 212 (Schirmer).

[32] And to rise from the required pipe bottom depth of 1.45 feet back to five feet on the building side, using just 6.25 feet in horizontal distance, requires a slope of 1.76:1, which is steeper than the 2:1 limit that the defendant asserts.

the storm drain piping to which the concrete aprons were to attach. *See* Ex. 1, CV6.3. The specific instruction that the aprons were to be "place[d] on uniform slope" is also provided. *See id.*, CV4.1; Ex. 3, HWY-2. The drawings "set forth in precise detail the materials to be employed and the manner in which the work was to be performed." *J.L. Simmons Co.*, 188 Ct. Cl. at 689. They "prescrib[ed] the character, dimensions and location" of the concrete aprons, thereby importing the implied warranty that the specifications were not defective. *Spearin*, 248 U.S. at 137. But was the absence of specific slopes for the building side of the aprons a patent ambiguity?

The Court concludes that any ambiguity in this regard was not patent. The supposed defect in the construction of the aprons related not to their function as devices to control erosion, but rather to the steepness of their slopes. *See* Ex. 58 at 1 (Jan. 12, 2001 Notice to Comply) 2 (Jan. 9, 2001 Hogue ltr.), Ex. 69 at 2-3 (May 29, 2001 Huggins ltr.). That the north sides of the aprons had slopes steeper than 2:1 was a defect not because the slopes were too steep to prevent erosion, but rather because the government believed that the aprons were designed to have a 2:1 slope. Ex. 58 at 1-2, Ex. 69 at 2-3; *see also* Ex. 75 at 1. Indeed, the only tangible problem identified with the north slopes of the aprons as initially installed had nothing to do with erosion of the ditch banks, but instead related to the ease with which the director of the facility could use a riding lawnmower in the vicinity to cut grass. *See* Tr. at 762, 801 (Hogue); *see also id.* at 190, 217 (Schirmer); Ex. 62 at 1. But concrete aprons are very different structures from highway lanes which, as was discussed above, have natural limits to their slopes to ensure the safety of vehicles using the lanes. Concrete aprons are not designed for traffic, but instead to prevent soil from being washed away by water, Tr. at 190 (Schirmer), and thus the slopes are what they are. The absence of a precise slope dictated by the design drawings is not an "obvious omission," *Beacon Constr.*, 161 Ct. Cl. at 7, or a "glaring gap," *WPC Enterprises*, 163 Ct. Cl. at 6, for this feature has no special importance to the design of an erosion control device. Nor does the incompatible information regarding the ditch slope and contour create so apparent a contradiction as to trigger the duty of inquiry, as this information does not on its face apply to the concrete aprons. *Cf. Triax*, 130 F.3d at 1475.

If the government wanted concrete aprons with north slopes of 2:1, it should have designed them that way. It did not. The government provided the design for the concrete aprons. *See* Ex. 1, CV4.1 Landscape Pavers reasonably followed the government's design in constructing the aprons, and had no duty to inquire whether the government desired a slope of any particular flatness to assist grass cutting or other activities unrelated to erosion control. If the government found the aprons as constructed to be defective, this defect springs from the design itself, and LPL is protected by the *Spearin* implied warranty. Thus, the order to partially remove and replace the concrete aprons constructively changed the contract, entitling LPL to an equitable adjustment covering the costs of complying with that order. *See* Ex. 2 (Solicitation § I.27 (incorporating 48 C.F.R. § 52.243-4)).

2. The Measure of Damages

On May 20, 2002, Travelers filed LPL's claim relating to the concrete aprons with the Contracting Officer. *See* Ex. 4 to Second Am. Compl. At the time, LPL was seeking $38,100 as compensation for the additional work. *Id.*; *see also* Ex. 71 at 1-2 & Tab N; Ex. 72 at 2. At trial, Mr. Schirmer testified that the amount sought on this claim was actually $41,432.41. Tr. at 219-20 (Schirmer). The difference was due to mathematical errors made by LPL when its claims were first calculated. *Id.*; *see also* Tr. at 158-59, 166-72 (Schirmer). The two categories of costs that make up the company's job cost overhead -- insurance, taxes and fringe benefits; and equipment ownership and operating expenses -- were calculated by LPL's accountant as percentages of the "direct labor" costs of the company. *See* Ex.71, Tab N at 5. But when LPL used the direct labor costs figure for the removal and replacement of the concrete aprons to derive the associated costs of these two other categories, it multiplied that figure by the wrong percentages. *See* Tr. at 219-20 (Schirmer); *compare* Ex. 71, Tab N at 5 (calculating insurance, taxes and fringe benefits to be 40.8% of direct labor costs, and equipment ownership and operating expenses to be 79.48% of direct labor costs) *with id.* at 3 (using 33.92% and 66.08%, respectively).

The government challenged, without citation to legal authority, LPL's corrections of its claims. *See* Tr. at 160. It argued that the higher claims were beyond our Court's jurisdiction, on the ground that LPL was seeking more from this Court than it asked of the Contracting Officer. *See id.* The Court rejected the government's jurisdictional argument and allowed LPL to increase the amount of damages sought in both its certified claim concerning the turn lanes, and its claim concerning the concrete aprons, as LPL was merely correcting computational errors and not altering the nature of the claims. *Id.* at 403; *cf. Tecom v. United States*, 732 F.2d 935, 937-38 (Fed. Cir. 1984) (holding that Armed Services Board of Contract Appeals had jurisdiction of CDA claim which was below certification threshold when brought before the contracting officer but was increased to exceed the threshold when brought before the Board); *J.F. Shea Co. v. United States*, 4 Cl. Ct. 46, 54-55 (1983) (holding that our Court has jurisdiction to consider a request for more damages than certified before the contracting officer).[33] Other than objecting to Mr. Schirmer's testimony correcting the damages calculation as occurring post-discovery, *see* Tr. at 164, the government did not address the damages evidence submitted by LPL. *See*, *e.g.*, Def.'s Proposed Findings & Concl.; Tr. at 873-930 (defendant's closing argument).[34]

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[33] The Court invited the parties to brief the matter further, *see* Tr. at 163-64, 403, but only plaintiff's counsel provided legal authority for its position. *See* Tr. at 328.

[34] The Court gave the defendant the opportunity to supplement the record with the declaration of an accounting expert challenging the manner in which Mr. Schirmer corrected the two line items of each claim, Tr. at 811-13; *see also* Order (May 14, 2004), but the government declined this offer.

The Court finds that LPL has proven, by a preponderance of the evidence, that it is entitled to $41,432.41 in damages due to the constructive change concerning the concrete aprons. Mister Schirmer testified convincingly as to the methodology used to calculate these damages. Tr. at 218-20. Landscape Pavers provided invoices or other documentation relating to materials used in the reconstruction of the concrete aprons, totaling $4,254.81. *See* Ex. 71, Tab N at 18, 20-24.[35] It also calculated the direct labor costs of removal and reconstruction of the concrete aprons to be $13,482.28, *see id.* at 4, based on gross payroll figures for that work that were certified and reported to the United States Department of Labor. *See id.* at 8-17 (Statement of Compliance forms for the four payroll periods running from May 31, 2001 through June 27, 2001); *see also* Tr. at 157-58 (Schirmer) (explaining these reports in the context of the turn lanes claim). Using the percentages calculated by LPL's accountant to represent the general correspondence between those categories and direct labor costs, *see* Ex. 71, Tab N at 5, Mr. Schirmer testified that insurance, taxes and fringe benefits for the concrete apron remediation work totaled $5,500.66, *see* Tr. at 219 (Schirmer), and that equipment ownership and operating expenses for this work totaled $10,715.49. *See id.* at 219-20.[36]

Added together, the cost of the direct materials, direct labor, insurance, taxes, fringe benefits, and equipment ownership and operating expenses for the additional work on the concrete aprons totaled just over $33,953. Tr. at 220 (Schirmer). After adding thirteen percent for LPL's overhead costs, based on its experience with Navy contracts, *see id.* at 149-51, and taking the resulting figure and adding another eight percent for LPL's profit on the work, *see id.* at 150, LPL calculated the total cost of the constructive change concerning the concrete aprons to be $41,432.41.[37] These markups for overhead -- which reflects both field and home office costs, *see* Ex. 72 at 3 -- and for profit are reasonable for public construction work, and are even on the low side. *See ACE Constructors, Inc. v. United States*, 70 Fed. Cl. 253, 279 (2006) (awarding fourteen percent markup for overhead and a ten percent profit rate). Landscape Pavers' testimonial and documentary evidence sufficiently proves that it is entitled to an award of $41,432.41 in damages, plus the appropriate interest, as compensation for the costs incurred due to the constructive change to the contract requirements concerning construction of the concrete aprons.

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[35] The invoices were from the following vendors: Soil Consultants, Inc., Ex. 71, Tab N at 18; Ford's Redi-Mix Concrete Co., Inc., *id.* at 21-22; and General Materials, LLC, *id.* at 23-24. The other documentation was a handwritten note identifying purchases from B & D Contractors, ostensibly made on June 14, 2001. *See id*. at 20. Copies of these documents were also submitted separately as trial exhibit 72. Landscape Pavers rounded the direct materials total up to $4,255. *Id.* at 2.

[36] These totals are 40.8% and 79.48% of $13,482, respectively.

[37] According to the Court's calculations, this figure should be $41,436.42. The Court will limit the award to the amount requested by LPL.

IV. CONCLUSION

The relevant contract documents contained a patent ambiguity regarding the slope of the turn lanes to be constructed by Landscape Pavers. The Court has found that LPL failed to satisfy its duty to inquire about this patent ambiguity, and thus cannot recover damages based on the implied warranty that specifications are free from design defects. In addition, the Court has found that the government had adequate cause to request density testing to confirm whether the subgrade was properly compacted under the turn lanes, and to require that the lanes be removed and reinstalled when LPL failed to have density tests performed on this subgrade.

The relevant contract documents did not require that the concrete aprons have any particular slope for their north sides. The absence of slope information for erosion control devices is not a patent ambiguity, as it would not be obvious to a reasonable contractor that the slope would have any relevance. The Court has found that LPL reasonably followed the design drawings in its initial construction of the concrete aprons, and that these aprons as initially constructed were adequate to control erosion. The defect in construction claimed by the government -- that a 2:1 slope was not accomplished on the north sides -- was unrelated to erosion control and was due entirely to the government's design drawings. The Court has found that LPL's work in constructing the concrete aprons was covered by the implied warranty that specifications are free from design defects. As a consequence, the government's order that LPL remove and reconstruct the north sides of these aprons was a constructive change to the contract, entitling LPL to an equitable adjustment. Landscape Pavers has proven by a preponderance of the evidence that it is entitled to an equitable adjustment in the amount of $41,432.41, plus interest.

Accordingly, the Clerk shall enter judgment for plaintiff on the second cause of action of case number 02-584C, on behalf of Landscape Pavers, in the amount of $41,432.41, with interest pursuant to 41 U.S.C. § 611, calculated from May 20, 2002. The parties shall file, by December 6, 2006, either a stipulation dismissing case number 03-1548C and dismissing the first cause of action of case number 02-584C, or a joint status report concerning these claims.

IT IS SO ORDERED.

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VICTOR J. WOLSKI
Judge