2018 – OTA – 209
Nonprecedential

OFFICE OF TAX APPEALS

STATE OF CALIFORNIA

In the Matter of the Appeals of:	)	OTA Case Nos. 18010221, 18010222, 18010223
	)	
CHARLES WALDEN AND DEBORAH ANDERSON, CHARLES WALDEN, AND WALDEN STRUCTURES, INC.	)	Date Issued: November 28, 2018
	)	
	)	
	)	

OPINION

Representing the Parties:

For Appellants: John Dies, Managing Director, alliantgroup, LP
Clay Hodges, Senior Assoc. Director, alliantgroup, LP
Edith Rodriguez, Paralegal, alliantgroup, LP

For Respondent: Carolyn Kuduk, Tax Counsel III
Jason Riley, Tax Counsel IV
Ray Rouse, Tax Counsel IV
Teresa Wignall, Bureau Director

G. THOMPSON, Administrative Law Judge: Pursuant to California Revenue and Taxation Code (RTC) sections 19045 and 19324, Charles Walden and Deborah Anderson (appealing together), Charles Walden (also appealing individually) and Walden Structures, Inc. (WSI) appeal the actions of respondent Franchise Tax Board (FTB) sustaining proposed assessments and denying refund claims for tax years 2003 through 2006.[1] FTB's actions were based on its determination that WSI was not entitled to research credits that it claimed for the years at issue, including claimed credit carryforwards.

Office of Tax Appeals Administrative Law Judges Grant S. Thompson, Douglas Bramhall, and Linda C. Cheng held an oral hearing in this matter on August 21, 2018. When the hearing concluded, Administrative Law Judge Grant S. Thompson closed the record and took the matter under submission.

[1] The actions from which appellants appeal are described in more detail below.

ISSUES

Whether, with respect to six sample projects,[2] appellants have satisfied their burden of proving that:

1. WSI's activities constituted qualified research activities under Internal Revenue Code (IRC) section 41(d)(1)[3] such that appellants are entitled to the claimed California research credit; and
2. WSI's activities are not excluded from the research credit as adaptation of an existing business component under section 41(d)(4)(B) or duplication of an existing business component under section 41(d)(4)(C).[4]

FACTUAL FINDINGS

General Background

1. For the years at issue, WSI was an S corporation organized under the laws of the State of California.[5] WSI's facilities were located in California, and it conducted the activities at issue in California.
2. Charles Walden was the sole shareholder WSI.[6] He was not an engineer, but he had decades of construction experience.

[2] As discussed below, the parties agreed to resolve the appeal based on the Office of Tax Appeal's determination with respect to six sample projects. Where the government and the taxpayer agree, sampling has been used to resolve cases involving the research credit. (See *Union Carbide Corp. and Subs. v. Commissioner*, T.C. Memo. 2009-50 (*Union Carbide*), affd. (2d Cir. 2012) 697 F.3d 104.)

[3] Unless otherwise stated, all section references refer to the IRC. With some modifications, California conforms to section 41 pursuant to RTC section 23609.

[4] The parties agreed that the remaining issues on appeal do not include the calculation of the fixed-base percentage or the documentation of the amount of expenses with respect to each project.

[5] S corporations are generally subject to California franchise and income tax at the rate of 1.5 percent, as opposed to the higher rates imposed on most corporations. RTC section 23803 generally allows S corporations to use one-third of the research credit to offset franchise and income tax.

[6] An S corporation shareholder generally may use the S corporation's research credits to offset income tax attributable to the shareholder's interest in the S corporation. (IRC, § 41(g).)

3. WSI filed amended tax returns for the tax years at issue and claimed California research credits on the amended tax returns as follows:

Tax Year	Amount
2003	$54,543
2004	$55,458
2005	$89,784
2006	$65,715

4. Generally, WSI only claimed a research credit for design and engineering activities, and did not claim a research credit for construction activities.[7]

5. FTB ultimately denied the research credits claimed by WSI on the amended tax returns. For the 2003, 2004 and 2005 tax years, WSI's amended tax returns sought to carry forward claimed research credits to subsequent tax years. For the 2005 and 2006 tax years, WSI claimed refunds, which FTB issued. However, following its examination, FTB determined that WSI was not entitled to the claimed research credits and issued proposed assessments of $37,532 in additional tax for the 2005 tax year and $22,253 in additional tax for the 2006 tax year.

6. During FTB's audit of WSI's amended returns, the parties agreed to the use the following six sample projects to evaluate whether WSI was entitled to the claimed research credits: Bramasole, Welk Resort, Mammoth Lakes Foundation Dorms (Mammoth Lakes), Mosque 1 & 2 (together, the Mosque Project), Genentech, and Ynez Elementary.

7. According to the parties' stipulated facts:

FTB denied refunds for Charles Walden for the following tax years as follows:

Tax Year	Amount
2003	$54,543
2004	$55,458
2005	$89,784
2006	$65,715

[7] Some of the time of manufacturing supervisors was claimed on the ground that the supervisors participated in the design process.

8. For the 2006 tax year, FTB initially issued a refund to Charles Walden, but subsequently issued a proposed assessment to Charles Walden and Deborah Anderson based on its determination that WSI was not entitled to the claimed research credits.
9. On October 26, 2016, FTB issued Notices of Action (NOAs) to WSI affirming FTB's proposed assessments for the 2005 and 2006 tax years. On this same date, FTB also issued a NOA to Charles Walden and Deborah Anderson affirming FTB's proposed assessment for the 2006 tax year.
10. On December 4, 2016, appellants filed these appeals.
11. During the appeal process, the parties agreed to use the same six sample projects to determine the appeals.

WSI's Business Practices

12. WSI was in the business of designing and constructing modular buildings. WSI sold its products to dealers. It did not make retail sales. WSI did not build modules to hold for inventory.
13. During the years at issue, Kevin Lord was an engineering manager.[8] In that role, he handled WSI's relationship with outside engineers with which WSI contracted. He was not an engineer, but he, along with other engineering managers, supervised WSI's draftsmen. He had more than twenty years of experience in modular construction.
14. WSI's building process would typically start with a customer requesting a quote, and describing the type of structure it wanted. This could be done verbally and could be accompanied by informal preliminary drawings.
15. WSI would then provide an approximate cost based on available information, such as the size of the project and whether the project was in an area with a great deal of snow (which would impose an additional weight load on the structure). If the customer moved forward, WSI would begin designing the desired product.
16. WSI would prepare preliminary drawings that were not intended for construction. These preliminary drawings would be shared with the customer, and WSI would often receive markups from the customer that changed the customer's prior direction.

[8] Unless otherwise indicated, all findings with regard to WSI's business activities refer to activities during the years at issue.

17. Then WSI would determine how the structure might be built using modular building techniques. Among other things, WSI considered how modular units could be used in the construction, how much of the structure could be completed at WSI's facilities, and whether the structure could be broken apart or structured in a way that it could be shipped on the highways to its ultimate location.

18. In addition to designing floor plans, WSI's draftsmen prepared mechanical, electrical, and plumbing designs. The draftsmen also provided engineering services, including making needed calculations and schedules. While some of the draftsmen had engineering degrees, they were not licensed engineers.

19. WSI would send its designs to outside engineers to determine if the proposed designs complied with engineering and code requirements. If the engineers identified deficiencies, the designs would be modified. Once the design was approved by the outside engineers, WSI would finalize drawings to be used in production.

20. One challenge of modular structures was the design of electrical systems. WSI tried to avoid having electrical systems cut across mating lines (i.e., lines between modules), so that, to the extent possible, each of the component modules would have a basically separate electrical system. However, the electrical systems needed to work together when the modules were connected. WSI would use crossovers to connect separate modules, which would have to be connected on site. In addition, the building modules had limited space in which to place electrical systems and other systems such as heating systems. In addition, WSI tried to design electrical systems which did not have to be shipped loose and installed on the site.

21. The use of modular structures impacted the design of heating, ventilation, and air conditioning (HVAC) systems. HVAC systems competed with electrical and other systems for the limited space available in the building modules.

22. WSI provided drawings and revisions which showed changes to its structure and illustrated its general design process.

23. A significant portion of WSI's projects were standardized or stock projects.[9] For both stock projects and customized projects, WSI would design the project, and then it would go to WSI's production team for construction.

24. Many of WSI's standard projects involved the construction of office space at Air Force bases. The standard dimensions for the building modules at the Air Force bases were typically 12 feet wide by 60 feet long. However, at times, WSI would use modules that had different dimensions, which it would consider a more custom product.

25. WSI maintained files of its customers' standard products. In some cases, those standard plans would need to be updated due to changes in building codes.

26. WSI's general process for its custom projects was very similar to its process for its standard projects. For WSI's custom projects, WSI would submit the proposed structure to an outside engineering firm to determine if the proposed structure complied with engineering and code requirements. If needed, further modifications to the proposed structure would be made as a result of the engineer's review or a result of difficulties encountered when the design was delivered to the production floor.

27. In general, the electrical, HVAC, plumbing, structural support, and other systems impacted one another and had to be considered together with one another in order for WSI to design its customized projects. WSI used computer-assisted-design (CAD) software to model how the proposed systems would be integrated with one another.

28. WSI's building process incorporated known engineering principles and calculations. For customized projects, WSI would develop a proposed design that was specific to the particular project and addressed the particular needs of that project. However, WSI's customized projects would also use and reference standardized designs for portions of the project. Sometimes, portions of the project drawings referred to a standardized structural package referred to as an S-1000. Such standardized packages had been approved by the California Department of Housing and Community Development and could be used to quickly build stock product.

[9] Mr. Walden's testimony and Mr. Lord's testimony indicated that approximately 30 to 40 percent of WSI's projects were standardized. However, Mr. Walden also testified that most of WSI's work was building office space at military bases and that this work would be considered more of a standard product.

General Background Regarding the Sample Projects

29. WSI did not consider any of the sample projects to be standard or stock products.

30. WSI stated that its process of experimentation for the six sample projects included (a) reviewing a "rough drawing" from the customer,[10] (b) changing price based on specialized needs such as lighting, materials, and ventilation, (c) modification of the design, (d) sending the plans to regulatory agencies for approval and (e) modifying the plans.

31. The Bramasole, Welk and Genentech Projects referenced the S-1000 standardized construction package.

The Mosque Project[11]

32. The buildings in the Mosque Project were built for a military contractor, Allied Container, which sold the projects to the military. They involved designing and constructing training facilities for use by soldiers to simulate and train for combat conditions. One of the model mosques was located in California, and the other model mosque was located in North Carolina. However, WSI conducted its design activities for the mosques in California.

33. The parties stipulated that "[i]n connection with design activity, [WSI] produced . . . [d]rawings, specifications, photographs, roof plans and elevation plans."

34. Allied Container put its name on design drawings for the Mosque Project, rather than WSI's name, in order to ensure that the military continued to work directly with Allied Container rather than working directly with WSI.

35. The designs for the project required multiple revisions.

36. In order to accomplish the purpose of military training, the buildings in the Mosque Project needed to resemble actual mosques. WSI did not claim research expenses with respect to giving the buildings in the Mosque Project a weathered appearance.

37. One of the two mosque buildings was three stories tall, and the other was two stories tall.

[10] The appeal record does not include any of these rough drawings for the sample projects. Mr. Walden testified that the initial drawings illustrated the concept and could have been just a drawing on a yellow pad.

[11] The Mosque Project consisted of Mosques 1 and 2. As the parties stipulated to treating it as one project, we treat it as one project.

38. Each mosque was topped with a heavy dome, in order to more closely resemble an actual mosque. WSI had not built similar domes before, and the record includes detailed drawings for the construction of the domes. The domes had to be shipped via ground transportation. The domes were split in half and then reconstructed at the site.

39. WSI used stacked and modified shipping containers to build the mosques. Large portions of the floor and ceiling of the mosque had to be cut out so that, when standing inside the model, one could look up all the way to the top of the dome. In addition, windows and doors were cut out of the side of the containers. Cutting out large portions of the floor and ceiling of the mosque hurt the structural integrity of the project, and required special modifications to support systems in order to ensure that the project was stable and could be transported safely. WSI used a beam to hold the project together. Later, it removed the beam and replaced it with braces in order to provide support to the structure. These modifications were evaluated using engineering calculations to ensure that they would support the structure.

40. WSI performed engineering calculations and tested designs to ensure that its structural supports would be adequate to support the heavy domes.

41. One requirement of the Mosque Project was that the mosques incorporated replaceable doors that the soldiers could practice breaking through (i.e., breaching). The breachable doors required a very strong frame but also had a door surface that could be breached and then easily replaced to conduct multiple trainings.

42. Another requirement of the Mosque Project was that the buildings have interior walls that could be easily moved in order to present varying training scenarios. In addition to being moveable, the interior walls had to be strong in order to withstand soldiers bumping into them with a full pack of military gear during combat training.

43. Trim was used in the construction of the mosques both to produce the desired cosmetic experience and to be watertight.

44. When WSI began the Mosque Project, it was not certain about the methods it would need to use to construct the buildings.

The Genentech Project

45. The Genentech Project was a long building with an irregular shape. It required extensive computer cabling and the use of 32 modular units. The irregular shape required special structural engineering such as the use of heavy-duty ties and the pulling of a diaphragm from one module into another module to connect the modules.

46. Mr. Walden stated that the standard office spaces it completed for Air Force bases would be "very, very similar" to what WSI built for Genentech, but that there was no design component for the Air Force offices.

47. The parties stipulated that "[t]he Project consisted of special design trusses in order to support the load of the computer equipment and cables that had to be loaded on the ceiling of the structure." The parties further stipulated that "[i]n connection with design activity, [WSI] produced . . . [d]rawings, specifications, photographs, roof plans and elevation plans." The parties also stipulated that "[t]he project called for a 70 [foot] clear span truss[,] . . . no load bearing walls and an open space."

48. The design for the Genentech Project states "This modular building is designed and built according to the structural package (S-1000) & supplement." A supplement to the S-1000 referred to a 55-foot truss and a 70-foot truss and referenced several structural details from the S-1000 package. The 55-foot truss plans are located in the S-1000 package. The outside engineer's plans for the 70-foot truss refer to another supplement for a 72-foot truss, adding a note stating, "except with offset peak," and refer to drawings by the engineer. Mr. Lord testified that the outside engineer developed all of the supplements. The engineer's plans for the 70-foot truss includes a notation to check cable trays and a calculation with respect to the support beam load of the cable trays. The plans further state "NOT CRITICAL. [72-FOOT] TRUSS USED FOR [70-FOOT] SPAN." Mr. Lord testified that the engineer apparently determined that the use of a 72-foot truss for a 70-foot span would be acceptable.

49. The documentation indicates at least five revisions to the project, one of which indicates it was requested by the client. Change order revisions include the following: extending walls, splitting a conference room into two offices, omitting windows, adding a new doorway, adding receptacles, revising circuit numbers and cross-over electrical circuits,

relocating data boxes, adding backing to various locations, adding roof joints, revising a window legend, shipping loose panel siding, and relocating an exit sign.

50. Mr. Lord testified that some design changes were needed because the customer wanted to hang something heavy, such as cabinets or furniture, to a wall. He stated that WSI had to order solid blocking due to inadequate support from the studs or spacing issues.

51. WSI's customer planned to lease the project to Genentech and needed for the project to be flexible so that the customer could find a use for the construction following the end of the lease. As a result, the customer required that the modules also be capable of being separated so that each module could be detached and used separately. WSI's customer also required nine-foot ceilings which was higher than typical.

52. The units were connected with extensive data cabling which was located in the ceiling and increased the load on the walls. The additional length required longer trusses than usual. Also, the increased height impacted the strength and support needed to ensure that the modules could be transported and withstand wind loads.

53. Mr. Lord testified that there were also issues with other systems and that all the systems had to be integrated and modeled with CAD to ensure that they would work together. He further testified that the design would then be sent to engineers to determine if it would work. He also testified that WSI had to systematically use CAD software to resolve conflicts that arose between structural systems.

54. Mr. Walden testified that there was uncertainty at the outset of the project with regard to how it should be designed.

The Bramasole Project

55. Bramasole was an office structure. It received an award for innovation from an industry trade group.

56. As reflected in a stipulation of the parties, "In connection with design activity, [WSI] produced the following documentation [with respect to Bramasole]: Structural Engineering Supplement #243, Floor Plans, Structure details, Plumbing Plan, Mechanical Plan, Electrical Plan, [and] multiple options for exterior elevations." In addition, the stipulation of the parties reflects that the Bramasole project had "non-standard design measurements."

57. The designs reflect six revisions. At least two of these revisions were required by the customer.

58. Mr. Walden testified that, at the beginning of the Bramasole project, there was uncertainty with regard to the method for building the parapets, and also as to the appropriate design for trusses and supports needed to handle wind load and seismic issues.

59. The parapets on the Bramasole project were of varying heights. The varying heights impacted the weight bearing down on the support structures.

60. The customer requested parapets of varying heights. The drawings reflected three different options for the parapets.

61. Mr. Lord stated that the customer changed its mind with regard to the height of the parapets.

62. Mr. Lord also testified that parapets were not common in WSI's structures and were "definitely not" in the S-1000 standard structural package. However, he further testified, in response to FTB's questioning, that it would not surprise him to learn that 33 of the 67 non-military structures for which WSI claimed the research credit during the years at issue included "special parapets."[12]

63. Due to the height of the structure, it could not be transported on the roads in its final form. In order to address this issue, WSI revised its preliminary plans to allow a portion of the project to be built on-site, after shipment.

64. WSI designed a clear-span truss for the project that spanned the length of the building. Once WSI designed its proposed truss structure, it would run calculations to determine if the proposed structure would be effective. The height of the parapets and anticipated wind and snow load impacted the design of the truss. The truss used was a 14-foot-wide product, while WSI's standard structural package was for 12-foot or smaller trusses. The truss was supported with both vertical and diagonal braces. WSI submitted its proposed truss design to an outside engineering firm which would perform calculations to determine if the proposed truss design would support the parapets and other anticipated loads.

[12] The appeal record confirms that many projects included special parapets.

65. The summary information for the Bramasole project references the S-1000 standard structural plans.

66. WSI designed a proposed electrical system for Bramasole. In Bramasole, lights were constructed right on the module, which reduced space for insulation.

67. WSI designed a proposed heating and air conditioning system for the Bramasole project. The customer requested the use of two larger units, rather than the use of units in each module. As a result, WSI had to develop a design that would allow for air to be pumped to all of the rooms through cross-overs.

68. WSI designed a plumbing system for Bramasole that would pump water from an intake point on site.

69. WSI used CAD software to model its proposed structures and ensure that the various systems, including structural supports, electrical and plumbing, would fit in the limited space available and accomplish their intended purposes.

The Ynez Elementary Project

70. Ynez Elementary was a two-story building with classrooms, parapets and a balcony. It also required a fire-proof corridor.

71. The parties stipulated that "[i]n connection with design activity, [WSI] produced . . . floor plans and elevation plans." The parties further stipulated that Ynez Elementary required that WSI comply with requirements of the California Division of the State Architect (DSA).

72. Mr. Walden testified that, at the time the project began, WSI had never previously constructed a project like Ynez Elementary.

73. In response to questions from FTB, Mr. Walden stated that the only problem he remembered specifically with regard to Ynez Elementary was that there were "site constraints." However, he also stated that it was a single-story building which was later changed to a multi-story building and that the design of the corridor was an issue.

74. Mr. Walden also testified that, at the outset, there was uncertainty with regard to the methods WSI would use to accomplish the project and as to the appropriate design of the project. The project required fire protection features such as sprinklers and a fire-resistant exit corridor that would allow children to easily exit the building in the event of

a fire. The use of modules for constructing the corridor presented a challenge because, at the intersection of the 12-foot modules, there was a mate-line where the modules intersected. The existence of the mate-lines made it more difficult to ensure that the corridor would withstand a fire long enough for children to exit the building.

75. Mr. Lord also testified that the need for a balcony also presented design challenges. He testified that the balcony was cantilevered on the second story of the structure and designed to hold the "live loads" imposed when children exited classrooms onto the balcony.

76. Mr. Lord stated that the DSA would approve plans in what is called a "PC," or a precheck. He further stated that the PC plans constituted a standard approved plan for different building configurations and acts as a starting point when designing something custom like Ynez Elementary.

77. On cross-examination, Mr. Lord stated that he did not work on the Ynez Elementary project.

The Mammoth Lakes Project

78. The Mammoth Lakes project was designed to be a large two-story dormitory building.

79. According to the stipulation of the parties, the Mammoth Lakes project "involved the special structural package design for wood constructed dormitory with 161 [pound] snow load roof design." The parties' stipulation also provides that "[i]n connection with design activity, [WSI] produced . . . [r]oof plans, floor plans, elevation plans, and [f]ire alarm plans [and] calculations."

80. The designs and plans provided for the Mammoth Lakes project do not reflect any revisions.

81. Mr. Lord testified that 95 percent of the dorm rooms were designed alike, and only five percent of the dorm rooms had a different design.

82. The Mammoth Lakes project was difficult because it was located in an area with a high earthquake risk, high winds, heavy snow loads, and a short building season. Modular construction was sought in part because it could be completed more quickly in the short construction season. The plan was that the building would be delivered in a form that was 90-95 percent complete.

83. WSI planned to use trusses that could support the anticipated snow loads and provide strength needed in light of the earthquake risk in the area.

84. The Mammoth Lakes project was not completed. Mr. Walden testified that he did not have an exact answer for why the project was not completed, but stated that it was a very challenging building and the cost kept increasing. He also testified that WSI did not know why the project was cancelled, but that the client decided not to go forward with it. Mr. Walden testified that, before the building was cancelled, WSI went through much of its design process.

85. According to Mr. Lord, in addition to the cost issue, there were also difficulties complying with American Disabilities Act requirements.

86. Mr. Walden testified that, at the beginning of the project, WSI only had certainties at the "concept level" as to the methods that would be used to solve the snow load issues, the mountainous area, and the seismic issues. He testified that WSI did not have certainty as to the appropriate design of the structure and that the combination of a 161 PSF (pounds per square foot) snow load and seismic issues created a design constraint that WSI had not encountered before. Additionally, another problem that WSI faced in the project was that the customer wanted to use a "very sophisticated boiler system" that WSI did not have experience with.

87. Mr. Lord testified that the Mammoth Lakes project likely needed to handle temperatures of well below zero degrees. He testified that it was the first time WSI had used a heater boiler system, and that it was a very large project, requiring 72 modular units. He testified it incorporated a chiller system that was used for heating and cooling, and also water supply. In addition, the system would be used to heat the roof structure.

88. Mr. Lord testified that the heating and cooling system used at Mammoth Lakes was very different from the HVAC systems typically used by WSI in that rather than using refrigerant and heating strips, the Mammoth Lakes system used water running through pipes to radiation units.

89. Mr. Lord testified that the use of modular construction in such a cold environment created design limitations because the vertical lines between the modules could let in frigid air; thus, WSI's design had to address this issue and ensure that the project met energy efficiency requirements.

90. Mr. Lord testified that the roof structure was a truss system that was going to be fabricated in WSI's factory and then constructed on the site. Additionally, the structure would need to support ten feet of snow and that there would be a fire sprinkler system running through the trusses. The heating system needed to ensure that the sprinkler system did not freeze.

91. Mr. Lord testified that, at the time WSI began the Mammoth Lakes project, there were uncertainties as to the methods it would use to solve the problems it faced, and in order to address these issues, WSI systematically used computer modeling, engineering calculations, and similar efforts to test its design and see if it would work.

92. On cross-examination, Mr. Lord stated he was not certain if the project was submitted to the outside engineer.

Welk Resort

93. Welk Resort was a new home center with three different ceiling requirements. The parties stipulated that, for Welk Resort, "[i]n connection with design activity, [WSI] produced the following documentation: Electrical plan, Mechanical plan, Wall Set plan, Floor Plans, Reflected Ceiling plans, Exterior elevation plans, Structural Details, and Structural Engineering Supplement #258." The parties further stipulated that "Welk Resort contained [a] non-standard design support system of 48 [feet] compared to the standard 60 [feet]."

94. Mr. Lord testified that the building was 45-feet long, which was a nonstandard length. He further testified that WSI's standard structural package would not have had beams to support a 45-foot span. WSI's customer wanted a gabled roof with clear-span support rather than intermediate posts.

95. On cross-examination, Mr. Lord testified that the project consisted of two separate buildings, a 24-foot by 48-foot building and a 24-foot by 60-foot building. He testified that two standard 12-foot by 60-foot modules were used to construct the 24-foot by 60-foot building.

96. The design for the larger building in the Welk Resort project states: "Structural System – Per Specs & Structural Package S-1000" and that "This modular building is designed and built according to the structural package (S-1000)." Mr. Lord testified that the S-1000

structural package might describe information relative to some portions of the construction of the building.

97. The floor plan and shear wall description for the larger building in the Welk project also reference sheets from the S-1000 structural package. Mr. Lord testified that those sheets were not included in the design plan because WSI's production team had those standard sheets on file on the production floor. The references to these standard sheets were common in many of WSI's standard buildings.

98. The design for the smaller building of the Welk Resort project states "Structural System – Per Specs & Structural Package S-1000 & Supplement #258" and further states "This modular building is designed and built according to the structural package (S-1000) and supplement #258."

99. On cross-examination, Mr. Lord testified that WSI had never constructed a beam with the specifications used in the smaller building where there was a 48-foot roof. WSI provided calculations used in designing the beam and Mr. Lord testified that values for the construction of the beam would be looked up in a manual. He further testified that the beam deflection equation was developed by the outside engineer that worked on the project. He stated that the outside engineer would use values provided by WSI, such as the length, and values from standard manuals, to make necessary calculations.

100. Mr. Lord testified that WSI was uncertain about making the needed steel beam because it was not included in the standard S-1000 package. He further testified that it was doubtful that WSI had used a 48-foot beam before the Welk Project. However, on cross-examination, Mr. Lord acknowledged that WSI had previously used a similar 48-foot steel beam for three other projects.

101. For the smaller building, a "lateral summary" for the floor plan referenced various S-1000 plans, including plans for the shear walls and roof.

102. Mr. Lord testified that a double-door entrance was located where a supporting post might otherwise have been located, and therefore required special engineering to develop a cantilevered support structure. He testified that the design of the span required custom engineering because it likely covered twice the distance as compared to any prior span WSI had completed.

103. The building had a coffered ceiling with different heights. The varying heights required multiple levels of support. In addition, the use of a coffered ceiling restricted the space available for HVAC ducts.

104. Mr. Lord testified that the design would be configured to resolve conflicts and then the calculations for the design would be sent to the engineer for review, with further revisions to the design if necessary.

105. Mr. Lord further testified that, at the beginning of the project, WSI did not have certainty as to the methods it would use to handle project features such as the different roof design and coffered ceilings. He testified that WSI systematically tried to resolve these issues through its design process.

106. The Welk Resort project went into production without any revisions to the design plans.

DISCUSSION

I. Interpretation of Tax Credit Statutes; Burden of Proof

"Tax credits are a matter of legislative grace, are only allowed as clearly provided for by statute, and are narrowly construed." (*United States v. McFerrin* (5th Cir. 2009) 570 F.3d 672 (*McFerrin*), 675.) Statutes granting tax credits are to be construed strictly against the taxpayer with any doubts resolved in FTB's favor. (*Dicon Fiberoptics, Inc. v. Franchise Tax Board* (2012) 53 Cal.4th 1227, 1235.)

The taxpayer has the burden of showing that the requirements for the research credit are satisfied. (See, e.g., *Trinity Industries, Inc. v. United States* (5th Cir. 2014) 757 F.3d 400, 415 (*Trinity II*), affg. in part, & vacating & remanding in part (N.D.Tex. 2010) 691 F.Supp.2d 688 (*Trinity I*).) Treasury Regulation section 1.41-4(d) provides that "[a] taxpayer claiming a credit under . . . section 41 must retain records in sufficiently usable form and detail to substantiate that the expenditures claimed are eligible for the credit." However, "[a] taxpayer is not required to keep records in a particular manner so long as the records maintained substantiate his or her entitlement to the credit." (*Suder v. Commissioner*, T.C. Memo. 2014-201 (*Suder*) [citing authorities]. See also *Shami v. Commissioner* (5th Cir. 2014) 741 F.3d 560, 567.)

II. Issue #1: Whether, with respect to the six sample projects, appellants have satisfied their burden of proving that WSI's activities constituted qualified research activities under section 41(d)(1) such that appellants are entitled to the claimed California research credit.

A. The Section 41(d)(1) Requirements

Section 41(d)(1) requires that, to be qualified research, claimed research must meet the following four requirements:

(1) the research expenditures must qualify as expenses under section 174 (the section 174 test);

(2) the research activity must be undertaken for the purpose of discovering information that is technological in nature (which we will refer to as the technological in nature test);[13]

(3) the research activity must be undertaken for the purpose of discovering information the application of which is intended to be useful in the development of a new or improved business component of the taxpayer; and

(4) substantially all of the research activities must constitute elements of a process of experimentation for a qualified purpose (the process of experimentation test).

(See, e.g., *McFerrin, supra*, 570 F.3d 672, 676.)

The requirements for qualified research must be applied separately to each business component. (IRC, § 41(d)(2).) Therefore, we first discuss WSI's business components.

1. The Business Components

A "business component" means "any product, process, computer software, technique, formula, or invention" which is held for sale, lease, or license or used in the taxpayer's business. In order to apply the section 41(d)(1) tests and obtain a research credit, the taxpayer must identify the business components for which it claims qualified research activities. (See, e.g., *Bayer Corp. and Subs. v. United States* (W.D.Pa. 2012) 850 F.Supp.2d 522, 540.)

Treasury Regulation section 1.41-4(b)(2) provides that, if the requirements of section 41(d) are not met at the level of the identified business component, the requirements are then applied "at the most significant subset of elements of the product, process, computer software, technique, formula, or invention to be held for sale, lease, or license." This is referred to as the

[13] As discussed further below, this test consists of two parts: a requirement that the research be undertaken to discover information, and a requirement that the information sought be technological in nature.

"shrinking-back" rule. The shrinking-back continues "until either a subset of elements of the product that satisfies the requirements is reached, or the most basic element of the product is reached and such element fails to satisfy the test." (*Id.*)

Treasury Regulation section 1.41-4(b)(3) provides an illustration where a credit is sought for building a new motorcycle engine that incorporates a new carburetor. If the modifications to the engine as a whole do not satisfy the requirements of section 41(d)(1) (e.g., the process of experimentation test), then those requirements are next applied to the carburetor (assuming it is the next most significant subset of elements of the business component).

Thus, if a taxpayer claims an entire product as its business component, it first must apply the requirements of section 41(d)(1) to the claimed research activities for the product as a whole. If the tests are not satisfied at this level, then the taxpayer may apply the shrinking-back rule to demonstrate that the section 41(d)(1) requirements are satisfied with respect to some smaller portion of the project. Where the shrinking-back rule applies, the taxpayer may be able to obtain some of its claimed research credit even if the taxpayer cannot show that all of its claimed research activities qualify for the credit. However, if there is not sufficient evidence to apply the shrinking-back rule (i.e., if there is not enough information to determine whether the section 41(d)(1) requirements are satisfied with respect to a smaller portion of the project), then the credit must be denied. (See *Trinity II*, *supra,* 757 F.3d 400, 404-405.)

For example, in *Trinity I*, *supra*, the taxpayer, Trinity Industries, Inc. (Trinity), identified as its business components certain "first in class" ships. However, the taxpayer did not attempt to separately identify and segregate expenses related to specific new aspects of any of the ships. (*Trinity I, supra*, 691 F.Supp.2d 688, 692.) As a result, the trial court found, and the Fifth Circuit agreed, that the shrinking-back rule could not be applied. The trial court characterized the taxpayer's approach as an "all or nothing approach" with respect to each ship, because, if the taxpayer could not demonstrate that the section 41(d)(1) requirements were satisfied with respect to the entire ship, the taxpayer would receive no research credits for the ship, even if it appeared that qualified research may have been conducted with respect to some portion of the ship. (*Id.* at pp. 692-693.)

Here, we find that appellants adequately identified the business components as each of the sample projects and that the claimed research activities were intended to develop or improve

the projects.[14] Like the taxpayer in *Trinity I, supra*, 691 F.Supp.2d 688, 691, appellants identified the relevant business components as the sample projects, rather than a particular part of the projects such as a beam or other feature. As a consequence, like Trinity, appellants bear the burden of showing that the claimed research activities with respect to each project, considered as a whole, satisfy the requirements of section 41(d)(1). Also like Trinity, appellants have not provided information from which one could shrink-back the claimed research activities to a particular portion of any of the projects. Accordingly, and again like Trinity, either all of WSI's claimed research activities with respect to each sample project will be qualified, or none of its claimed research activities with respect to the sample project will be qualified.

2. The Section 174 Test

Section 174 addresses "research or experimental expenditures" that are paid or incurred in connection with a taxpayer's trade or business. Here, it is undisputed that the expenses were paid or incurred in connection with WSI's trade or business.

Treasury Regulation section 1.174-2, together with Treasury Regulation section 1.41-4(a)(3), address the requirement that the claimed research be undertaken for the purpose of discovering information which is technological in nature. We discuss this requirement below.

3. The Technological in Nature Test

Section 41(d)(1)(B) requires that research be undertaken for the purpose of discovering information which is technological in nature. Section 41(d)(1)(B), and the regulation provisions implementing and interpreting it, consist of two parts: a requirement that the research be undertaken to discover information, and a requirement that the information sought be technological in nature.

With regard to the requirement that the information sought be technological in nature, Treasury Regulation section 1.41-4(a)(4) provides as follows:

> . . . information is technological in nature if the process of experimentation used to discover such information fundamentally relies on principles of the physical or biological sciences, engineering, or computer science. A taxpayer may employ existing technologies and may rely on existing principles of the physical or biological sciences, engineering, or computer science to satisfy this requirement.

[14] Under subheading 3 below ("The Technological in Nature Test") we discuss whether the claimed research activities were undertaken for the purpose of discovering information which is technological in nature.

As WSI's claimed research activities relied on "principles of the physical . . . sciences" and engineering principles, we find that the activities satisfied this part of the technological in nature test.

With regard to the requirement that the research be undertaken to discover information, Treasury Regulation section 1.174-2(a)(1) defines section 174 expenses as representing "research and development costs in the experimental or laboratory sense" and states that this standard is met if the activities at issue would "eliminate uncertainty concerning the development or improvement of a product." The regulation explains as follows:

> The term research or experimental expenditures, as used in section 174, means expenditures incurred in connection with the taxpayer's trade or business which represent research and development costs in the experimental or laboratory sense. The term [research or experimental expenditures] generally includes all such costs incident to the development or improvement of a product. The term includes the costs of obtaining a patent, such as attorneys' fees expended in making and perfecting a patent application. *Expenditures represent research and development costs in the experimental or laboratory sense if they are for activities intended to discover information that would eliminate uncertainty concerning the development or improvement of a product*. Uncertainty exists if the information available to the taxpayer does not establish the capability or method for developing or improving the product or the appropriate design of the product. Whether expenditures qualify as research or experimental expenditures depends on the nature of the activity to which the expenditures relate, not the nature of the product or improvement being developed or the level of technological advancement the product or improvement represents. The ultimate success, failure, sale, or use of the product is not relevant . . . . [Emphasis added.]

Thus, Treasury Regulation section 1.174-2 only requires that the activities be intended to discover information that would eliminate uncertainty concerning the development or improvement of the product. The regulation does not require that the taxpayer's activities seek to discover information that goes beyond the current state of knowledge.[15]

Similarly, Treasury Regulation section 1.41-4(a)(3)(i) provides as follows:

> Research is undertaken for the purpose of discovering information if it is intended to *eliminate uncertainty* concerning the development or improvement of a business component. *Uncertainty exists if the information available to the*

[15] In contrast, the prior rule, referred to as the "Discovery Rule," required that activities be undertaken to discover information that went beyond or refined the current state of knowledge. In response to concerns raised regarding the Discovery Rule, the Treasury Department adopted new regulations that revoked the Discovery Rule and set forth a more lenient requirement for discovering information. (Treasury Decision 9104, Int. Rev. Bull. 2004-6.) In its briefing and oral argument, FTB acknowledged that the Discovery Rule is no longer applicable.

> *taxpayer does not establish the capability or method for developing or improving the business component, or the appropriate design of the business component*. [Emphasis added.]

In its opening statement, FTB seemed to concede that the "technological in nature test" was satisfied. However, in its questioning of appellants' witnesses and its closing argument, FTB argued that WSI's claimed research activities did not address sufficient uncertainties and that the research did not qualify for the credit on the ground the research did not involve high technology. As an example, FTB posed the hypothetical of a scientist conducting tests to cure cancer. FTB argued that, at the end of each day, the scientist would "have no idea if he cured cancer" or "if his process worked." FTB argued that, unlike the cancer researcher, WSI always knew that the project could be completed. FTB argued that the type of uncertainty illustrated by the cancer researcher was the "only" type of uncertainty that would entitle one to the research credit.

FTB's arguments are incorrect and clearly contradicted by the applicable regulations. Treasury regulation section 1.174-2 expressly states that whether expenses qualify as research expenses does *not* depend on "the nature of the product or improvement . . . or the level of technological advancement the product or improvement represents." Similarly, Treasury Regulation section 1.41-4(a)(3)(ii) clearly provides that "[a] determination that research is undertaken for the purpose of discovering information that is technological in nature does *not* require that the taxpayer be seeking to obtain information that exceeds, expands or refines the common knowledge of skilled professionals in the particular field of science or engineering in which the taxpayer is performing the research." (Emphasis added.)

As relevant here, Treasury Regulation section 1.41(a)(3)(i) requires that we determine whether the information available to WSI established the capability or method for developing or improving the project, or the appropriate design of the project. In applying this standard, we recognize that every research project must start, to some extent, with existing knowledge. That is, the uncertainty requirement does not require that WSI have started a project from a blank slate without any knowledge of engineering or design principles. Moreover, as the above discussion makes clear, the uncertainty requirement does not require that WSI have been seeking a scientific breakthrough. Rather, the discovery requirement merely requires that, at the beginning

of the project, available information not "establish" the method for developing the project or the appropriate design of the project.

We also note that, while the sample projects incorporated standard design features, each of the projects also reflected many detailed custom designs. The fact a project incorporates some standardized parts does not necessarily lead to the conclusion that available information establishes the appropriate design of the project. While the testimony of Mr. Lord and Mr. Walden was not infallible, their testimony, together with the design drawings, established that integrating various competing features into an overall design was not as simple as picking items from a menu. (See *Trinity I, supra*, 691 F.Supp.2d 688, 692 [rejecting the government's argument that the integration of various systems was "nothing more than ordering [items] off a menu . . ."].) With the foregoing in mind, we consider the specific projects at issue in this appeal.

The buildings in the Mosque Project incorporated unusual features. They were two to three stories high and required the construction of a heavy dome to be placed on top of each structure. In addition, large portions of the floors and ceiling had to be cut out, which weakened the structure. As a result, reinforcements had to be designed to ensure that the structure was stable. The parts of the structures also had to be designed so that they could be transported on the road. In addition, the military training purpose of the structures required that WSI develop breachable doors that could be easily replaced, and interior walls that could be adjusted in order to vary the layout of the structure. We find that, while WSI used available engineering information to design the structures, available information did not establish the appropriate design of the structures.

The Genentech Project was a large project with an irregular shape. It involved extensive computer cabling and required that each of the project's 32 units work together, but also be potentially separable. The design of the project required several revisions, including multiple revisions to designs for the electrical system. However, the parties disputed whether the trusses used in the Genentech Project were unusual or required special design work, and FTB pointed out that the designs for the Genentech Project references structural details set forth in the S-1000 structural package. We find that, while some parts of the project were standardized, available information did not establish the appropriate overall design of the structure, especially considering the computer cabling requirements of the structure.

The Bramasole Project received an award for innovation from an industry trade group. On appeal, FTB and appellants stipulated that the Bramasole Project reflected "non-standard design measurements." The design needed to incorporate a clear span truss, lights that were constructed on the module, and parapets of varying heights. Again, we find that, while some parts of the design were standardized, available information did not establish the appropriate overall design of the structure, especially considering the fact the project won an industry award for innovation.

The Ynez Elementary Project required that the design incorporate a fire-proof corridor and a cantilevered balcony on the second floor. While WSI designed many school buildings during the years at issue, Mr. Walden testified that it had not previously constructed a project like Ynez Elementary, and Mr. Lord testified that, to his knowledge, WSI had not previously constructed a fire corridor with a mate-line where the modules intersected, making it more difficult to ensure that the corridor would withstand a fire long enough for the children to exit the building. While our conclusion is not free from doubt, we find that appellants established, by a preponderance of the evidence, that the available information did not establish the appropriate overall design of the structure.

The Mammoth Lakes Project was intended to be a large two-story dormitory building with 72 units. FTB and appellants stipulated that the project "involved the special structural package design for wood constructed dormitory with 161 [pound] snow load roof design." Because the project was located in the mountains, the design had to be structured to withstand an earthquake, high wind, heavy snow loads, and a short building season. In addition, the project required an unusual boiler and HVAC system that could withstand extremely frigid conditions while meeting energy efficient requirements. In light of the design challenges faced by the Mammoth Lakes Project, we find that the available information did not establish the appropriate overall design of the structure.

The Mammoth Lakes Project was not completed. However, Treasury Regulation section 1.41(a)(ii) provides that "a determination that research is undertaken for the purpose of discovering information that is technological in nature does not require that the taxpayer succeed in developing a new or improved business component." Therefore, it is irrelevant that the Mammoth Lakes Project was not completed.

As stipulated by the parties, Welk Resort "was a new home center with three different ceiling requirements." Mr. Lord first testified that it was "doubtful" that WSI had used a similar 48-foot beam but on cross-examination conceded that WSI had employed a similar beam on three prior projects. The building had a coffered ceiling with varying heights, which was not common in modular design, and the varying heights required multiple levels of support and restricted the space available for HVAC ducts. While these features suggest a degree of uncertainty, the Welk Resort Project went into production without any revisions to the design plans, and it also incorporated features, such as the floor plan and shear walls, that were based on the standard S-1000 structural package. In sum, it appears that Welk Resort incorporated both challenging features and more ordinary features. While our conclusion is not free from doubt, we find that appellants established, by a preponderance of the evidence, that the available information did not establish the appropriate overall design of the structure.

4. The Process of Experimentation Test

Section 41(d)(1)(c) requires that "substantially all" of the claimed research activities with respect to each business component (or a subset of the business component under the shrinking-back rule) constitute "elements of a process of experimentation" for a qualified purpose.[16]

With regard to the "substantially all" requirement, Treasury regulation section 1.41-4(a)6 provides that the substantially all requirement is satisfied "only if 80 percent or more of a taxpayer's research activities, measured on a cost or other consistently applied reasonable basis . . . constitute elements of a process of experimentation . . . ."

Treasury Regulation section 1.41-4(a)(5)(i) defines a "process of experimentation" as follows:

> *. . . a process designed to evaluate one or more alternatives to achieve a result where the capability or the method of achieving that result, or the appropriate design of that result, is uncertain as of the beginning of the taxpayer's research activities.* A process of experimentation must fundamentally rely on the principles of the physical or biological sciences, engineering, or computer science and

[16] A purpose is qualified "if it relates to a new or improved function, performance, reliability or quality of the business component." (Treas. Reg. § 1.41-4(a)(5)(ii).) However, a purpose is not qualified "if it relates to style, taste, cosmetic, or seasonal design factors." (§ 41(d)(3)(B).) In its closing argument, FTB stated that the qualified purpose requirement of section 41(d)(3) was "not relevant." Thus, we consider this argument waived. However, we note that some aesthetic features can serve an operational function. For example, the construction of domes in the Mosque Project advanced the military customer's purpose of providing a training facility that modeled real world locations.

> involves the identification of uncertainty concerning the development or improvement of a business component, the identification of one or more alternatives intended to eliminate that uncertainty, and the identification and the conduct of a process of evaluating the alternatives (through, for example, modeling, simulation, or a systematic trial and error methodology). A process of experimentation must be an evaluative process and generally should be capable of evaluating more than one alternative. *A taxpayer may undertake a process of experimentation if there is no uncertainty concerning the taxpayer's capability or method of achieving the desired result so long as the appropriate design of the desired result is uncertain as of the beginning of the taxpayer's research activities. Uncertainty concerning the development or improvement of the business component (e.g., its appropriate design) does not establish that all activities undertaken to achieve that new or improved business component constitute a process of experimentation*. [Emphasis added.]

As noted previously, the process of experimentation test must be applied to the claimed research activities with respect to each business component. Here, the business components are the sample projects.

Appellants claim that WSI's entire design and engineering process for the sample projects constituted a process of experimentation. Appellants argued that, through WSI's design process, it proposed a structure, and then, using CAD software, systematically tested and modified that proposed structure to ensure that the proposed structure could be built. Appellants further argued that, when WSI submitted its proposed designs to outside engineers in order to determine if the structure could be built, WSI was testing its proposed structure, and, as necessary, would then revise the proposed design.

FTB argued that appellants' documents do not show an evaluative process involving the systematic testing of alternatives. FTB pointed out that Mr. Walden testified that revisions in the plans could have come from customer's changes or could be the result of an engineering determination that changes were needed. FTB contended that WSI never established which activities were customer-driven and which activities were experimentation.

In support of their position, appellants pointed to *Trinity I, supra*, 691 F.Supp.2d 688. In that case, the trial court evaluated a claim for research credits involving the design and construction of six new types or classes of ships. The court observed that the systems on the ships interact with one another and the taxpayer had to develop a design that integrated the systems with one another. Therefore, the court found that "the simple fact that a new vessel incorporates existing systems does not resolve the [qualified research expense] issue against

Trinity." On the other hand, the court also found that "the simple fact that a ship was first in class does not necessarily mean that use of a well-known component, such as an engine, constitutes a process of experimentation."

As a result, the court found that it must examine each ship to determine whether 80 percent of the costs of each ship constituted a process of experimentation. In order to do this, the court evaluated each ship as a whole to determine whether it was so novel and new that at least 80 percent of the costs constituted a process of experimentation. For some ships, the court found that this requirement was met. For other ships, the court found that, while there clearly was some experimentation, much of the design was not new or different, and denied the credit.

For example, the court considered the "Mark V" ship project. It was a "very innovative special operations deployment craft" and, at the time it was built, "nothing like [it] existed in the world." It was required to be fast, have a low radar profile, support a variety of weaponry, and incorporate a carrier that would allow it to be transported by airplane. In view of the novelty and difficulty of the Mark V design, the court found that more than 80 percent of the overall costs of the project constituted a process of experimentation.

However, for another project, the "XFPB" ship, the court denied the credit. It noted that this ship had to have a maximum speed of at least 50 knots while also housing a crew of 16 for extended periods. The court stated that the main challenge of the XFPB ship was combining the speed requirement with the living-quarter requirement, and that Trinity had no existing vessel that could satisfy the requirements. The court found that the XFPB ship "clearly involved a process of experimentation," in part due to the design challenge of the high speed requirement. However, the court found that, while this part of the design was novel and uncertain, the "patrol boat" part of the design appeared to be "fairly routine." Considering the entire project, the court found that it had "substantial uncertainty" regarding whether the 80-percent threshold was met and therefore was "reluctantly" required to find that Trinity failed to meet its burden of proving that the 80-percent threshold was met.[17]

Here, to the extent that appellants argue that the entire process for each project constituted a process of experimentation, we find this argument to be overbroad and inconsistent

[17] We note that, in *Trinity I*, many records of the taxpayer had been destroyed or were otherwise unavailable. This did not change the taxpayer's burden of proof.

with *Trinity I*.[18] Furthermore, Treasury Regulation section 1.41-4(a)(5)(i) provides that the mere existence of uncertainty with regard to the design of a component "does *not* establish that *all* activities undertaken to achieve that new or improved business component constitute a process of experimentation." (Emphasis added.) On the other hand, to the extent that FTB argues that the incorporation of standard structural features forecloses a finding that the process-of-experimentation test is satisfied, we also find this argument to be overbroad and inconsistent with *Trinity I*.[19] Like the court in *Trinity I*, we will examine each project to determine whether the process of experimentation requirement is satisfied.

Before discussing the sample projects, we note that WSI claimed all of the time of WSI's Engineering Department as qualified research. Thus, it appears that, with respect to each of the six sample projects, WSI claimed all of the time that its Engineering Department spent on the projects as qualified research activities. However, unlike the taxpayer in *Trinity I*, *supra*, WSI did not include construction and supply costs. Instead, WSI's claimed research credit was based on its design and engineering activities.

With the foregoing in mind, we consider, with respect to each of the six sample projects, whether appellants have shown that at least 80 percent of its claimed research activities constituted a process of experimentation.

The Mosque Project

As previously noted, the Mosque Project required the design of heavy domes, breachable doors that could easily be replaced, and interior walls that could be moved to vary the layout of the structures. Mr. Walden credibly testified that WSI had never previously built similar domes. The use of movable interior walls necessarily meant that those walls could not be load-bearing

[18] WSI only claimed the research credit for custom projects, and it focused on project features that were especially novel or challenging so as to eliminate design activity on standard building projects from credit consideration. While this approach was reasonable, it appears to implicitly acknowledge that WSI's general design procedures do not, standing alone, show that at least 80 percent of each of WSI's projects constituted a process of experimentation. Additional evidence is needed to differentiate between design activity associated with general construction and the activity associated with the specific difficulties and challenges that required a process of experimentation.

[19] We note that, in *Suder*, T.C. Memo. 2014-201, the tax court applied *Trinity I* and found that the taxpayer's systematic modeling and testing of schematics to address uncertainties sufficiently established a qualified process of experimentation. Similarly, Treasury Regulation section 1.41-4(a)(8), Example 3, provides the example of a manufacturer using a qualified process of experimentation to design a thinner shredding blade that is capable of more finely shredding food products. *Suder* and Example 3 illustrate that a process of experimentation need not involve beakers and test tubes, and that a process of experimentation can take place through a design process.

walls. In addition, the project required the removal of large portions of the floors and ceilings, which greatly weakened the structure and thus required the design of other sources of support. WSI had to perform engineering calculations and test the designs to ensure that its structural supports would be sufficient to support the heavy domes. The design for the project required multiple revisions.

In short, it appears that many major features of the Mosque Project were novel or new – a heavy dome, ceilings and floors from which large portions had to be cut out, breachable doors that could be easily replaced, and the use of moveable non-load-bearing interior walls. All of these novel features had to be integrated and designed in such a way that the pieces of the project could then be shipped over the roads and assembled on-site.

Mr. Walden and Mr. Lord provided credible testimony that, when WSI began the Mosque Project, it did not have certainty as to how the project could be designed. Based on the design drawings, photos, and testimony, the project was far different from any of the other projects in the record and had to be systematically modeled to test the appropriate designs. We find that appellants have shown, by a preponderance of the evidence, that at least 80 percent of the project constituted a systematic process of experimentation to determine, using CAD software and engineering principles, whether and how the project's challenging and novel design requirements could be integrated into a structurally sound whole.[20]

The Genentech Project

Appellants identified several unusual features of the Genentech Project. As noted previously, it had an unusual shape, was unusually large, involved extensive computer cabling, and required that each of the project's 32 units work together, but also be potentially separable. Mr. Lord testified that the computer cabling requirements added extra weight that required

[20] We note that our analysis of whether at least 80 percent of the project constituted a process of experimentation is similar to the analysis applied in *Trinity I*, *supra*, which we describe above. We further note that, in *Suder*, *supra*, the tax court applied *Trinity I* extensively in its discussion of the process of experimentation test. Rather than conducting a purely mathematical evaluation of timesheets or similar time records, both the federal district court in *Trinity I* and the tax court in *Suder* considered the entire record, including testimony, to determine whether "substantially all" (i.e., at least 80 percent) of each project constituted a process of experimentation. FTB emphasized *Union Carbide*, *supra*, but *Suder* and *Trinity I* were decided after, and are consistent with, *Union Carbide*.

changes to the roofing and truss systems. The design of the project required several revisions, some of which included designs for the electrical system.

FTB pointed to evidence that suggested that the truss designs were not unusual, specifically a 55-foot truss that appeared to be based on a standard design, and a 70-foot truss that was largely based on a standard 72-foot design. FTB also noted that, while appellants emphasized the additional weight imposed by the computer cabling, the engineer's cable tray calculations appeared to be fairly simple and stated: "Not critical. 72-foot truss used for 70-foot span." In response to FTB's questions, Mr. Lord stated that he understood the engineer's records to indicate that "as long as we used a 72-foot truss for a 70-foot span we were okay," because the 72-foot truss "would have had a larger core of materials."

FTB pointed out that the designs for the Genentech Project reference structural details set forth in the S-1000 structural package. In response to FTB's questions, Mr. Walden stated that the standard office spaces it completed for Air Force bases would be "very, very similar" to what WSI built for Genentech, but that there was no design component for the Air Force offices.

The documentation for the project indicates at least five design changes. However, it is not clear which, if any, of the changes resulted from a process of experimentation, as many of the design changes appear to be ordinary course changes in specifications. One of the design changes was requested by the client. The design changes include, for example, splitting a conference room into two offices and relocating exit signs.

As an example of the design challenges WSI faced, Mr. Lord testified that some design changes were needed because the customer wanted to hang something heavy, such as cabinets or furniture, to a wall. He stated that WSI had to order solid blocking due to inadequate support from the studs or spacing issues. We note that the implementation of this customer change order does not evidence the type of systematic process of considering and testing hypotheses that might be considered a process of experimentation. Rather than supporting appellants' arguments, the example illustrates that some portion of appellants' claimed research activities constituted ordinary construction work rather than a process of experimentation.

In the absence of evidence specifically showing which portion, if any, of WSI's activities constituted a process of experimentation, we are unable to find that appellants have demonstrated that at least 80 percent of WSI's claimed research activities for the Genentech Project constituted a process of experimentation. (Compare *Trinity I, supra,* 691 F.Supp.2d 688, 695-696 [stating

that, while the court accepted that a significant portion of the project constituted a process of experimentation, it "somewhat reluctantly must find" that Trinity failed to meet its burden of proving that 80 percent of the project constituted a project of experimentation].)

The Bramasole Project

As noted previously, the Bramasole Project received an award for innovation from an industry trade group. FTB and appellants stipulated that the Bramasole Project reflected "non-standard design measurements." The design needed to incorporate a clear span truss, lights that were constructed on the module, parapets of varying heights, a high roof, and a high wind load.

Appellants argued that the design of the parapets and trusses created challenging design issues. Mr. Lord testified that parapets were not common in WSI's structures. However, the record reveals that many of WSI's projects during the years at issue included parapets. In fact, in response to questioning from FTB, Mr. Lord testified that it "would not surprise him" to learn that 33 of the 67 non-military structures for which WSI claimed the research credit during the years at issue included "special parapets."

Also, on cross-examination, Mr. Lord acknowledged that the customer changed its mind with regard to the height of the parapets, which leads us to conclude that some portion of the design changes arose from changes in the customer's preferences rather than a technical process of experimentation. The documentation in the record also suggests that at least two of six listed design revisions were made at the request of the customer. While these customer-driven changes required additional design work, it is difficult to determine what portion, if any, of this work constituted a systematic process of testing alternatives.

WSI also claims to have designed a unique clear-span truss for the project that spanned the length of the building. However, the documentation suggests that the truss design was, in significant part, based upon an existing truss design that was set forth in an engineering supplement.

Similarly, at the oral hearing, appellants emphasized the design difficulties caused by the use of parapets. However, as noted above, the record shows that WSI had frequently designed parapets. Also, while the particular design features of these parapets may have presented challenges, the parapets were just one part of the larger project.

The design drawings for the project further indicate that the project, or at least portions of it, were based on the standard S-1000 structural package.

Considering the record as a whole, it appears that the Bramasole project was challenging, and it likely involved some activities that might be characterized as a process of experimentation. However, appellants have not carried their burden of proving that at least 80 percent of WSI's claimed research activities for the project constituted a process of experimentation.

The Ynez Elementary Project

The Ynez Elementary Project required that the design incorporate a fire-proof corridor and a cantilevered balcony on the second floor. While WSI designed many school buildings during the years at issue, Mr. Walden testified that it had not previously constructed a project like Ynez Elementary, and Mr. Lord testified that, to his knowledge, WSI had not previously constructed a fire corridor like the one in Ynez Elementary.

Mr. Lord stated that the DSA would approve plans in what is called a "PC," or a precheck. He further stated that the PC plans constituted a standard approved plan for different building configurations and acts as a starting point when designing something custom like Ynez Elementary.

In response to questions from FTB, Mr. Walden stated that the only problem he remembered specifically with regard to Ynez Elementary was that there were "site constraints." He stated that it was a single-story building but he changed it to a multi-story building and that the corridor was an issue.

While the evidence indicates the construction of the fire-corridor was unusual, a substantial portion of the design included classrooms, and it appears that WSI has a great deal of experience constructing modular classrooms. Mr. Lord was one of appellants' primary witnesses with respect to the Ynez Schools Project, but he did not work on the project.

Based on the record, we are unable to find that appellants demonstrated that at least 80 percent of WSI's claimed research activities for the Ynez Elementary Project constituted a process of experimentation.

The Mammoth Lakes Project

As noted previously, the Mammoth Lakes Project was intended to be a large two-story dormitory building that "involved the special structural package design for wood constructed

dormitory with 161 [pound] snow load roof design." Because the project was to be located in the mountains, the design had to be structured to withstand an earthquake, high wind, heavy snow loads, and a short building season. In addition, the project required an unusual boiler and HVAC system that could withstand extremely frigid conditions while meeting energy efficient requirements.

There is no evidence that the Mammoth Lakes Project was submitted to an outside engineer for approval. The documentation provided by appellants does not indicate any revisions were made to the preliminary drawings. While a process of experimentation can consider just one alternative, the record does not show that at least 80 percent of the claimed activities constituted the type of systematic, iterative process that might typically be associated with a process of experimentation.

It appears that the project presented many design challenges, but we cannot determine from the record what portion, if any, of WSI's work might be viewed as testing to overcome these design challenges, as opposed to the drawing of routine items. For example, while the boiler and HVAC system may have been unusual, many drawings relate to items such as doors, windows, rails, trim details, and cabinets. The general floor plans appear to primarily reflect standard-sized modular units which were stacked on top of one another. Mr. Lord testified that 95 percent of the dorm rooms were designed alike, and only five percent of the dorm rooms had a different design.

Mr. Lord also testified that one difficulty was that the architect for the project continued to add features. For example, he testified that the architect was unfamiliar with American Disability Act requirements, which required additional design work. While additional work may have been required to address difficulties with the architect, it is not clear what portion, if any, of the claimed research activities related to such difficulties or whether such activities constituted a scientific process of experimentation.

Based on the record, we are again unable to find that appellants demonstrated that at least 80 percent of WSI's claimed research activities with respect to the project constituted a process of experimentation.

The Welk Resort Project

As noted previously, Welk Resort "was a new home center with three different ceiling requirements." Mr. Lord first testified that it was "doubtful" that WSI had used a similar 48-foot beam but later conceded that WSI had employed a similar beam on three prior projects. The building had a coffered ceiling with varying heights, which was not common in modular design, and the varying heights required multiple levels of support and restricted the space available for HVAC ducts.

According to Mr. Lord, a double-door entrance was located where a supporting post might otherwise have been located, and therefore required special engineering to develop a cantilevered support structure. He testified that the design of a span required custom engineering because it likely covered twice the distance as compared to any prior span WSI had completed.

The Welk Resort Project went into production without any revisions to the design plans. The Welk Resort Project incorporated features, such as the floor plan and shear walls, that were based on the standard S-1000 structural package.

Based on the record, we are again unable to find that appellants demonstrated that at least 80 percent of the claimed research activities for the project constituted a process of experimentation.

III. Issue #2: Whether, with respect to the six sample projects, appellants have satisfied their burden of proving that WSI's activities are not excluded from the research credit as adaptation of an existing business component under section 41(d)(4)(B) or duplication of an existing business component under section 41(d)(4)(C).

We only consider this issue in connection with the Mosque Project because we have found that appellants failed to show that WSI's claimed research activities for the other projects constituted qualified research under Section 41(d)(1).

IRC section 41(d)(4)(B) provides that "qualified research" does not include "[a]ny research related to the adaptation of an existing business component to a particular customer's requirement or need." IRC section 41(d)(4)(C) similarly provides that "qualified research" does not include "[a]ny research related to the reproduction of an existing business component (in whole or in part) from a physical examination of the business component itself or from plans,

blueprints, detailed specifications, or publicly available information with respect to such business component." These are often referred to as exclusions for "adaptation" or "duplication."

At the oral hearing, appellants pointed out that the Treasury Department and the IRS stated, in the preamble of Treasury Decision 9104, *supra*, that the commercial production, adaptation and duplication exclusions set out in Section 41(d)(4)(A), (B) and (C) "do not cover research activities that otherwise satisfy the requirements for qualified research."[21] Accordingly, appellants argue that there is no need to consider the adaptation and duplication exclusions once it has been determined that claimed activities otherwise satisfy the requirements for qualified research.

California law conforms to federal law with respect this issue, and this determination of the Treasury Department was formally published after an extensive public comment process. Furthermore, RTC section 23051.5(d) provides as follows:

> When applying the [IRC] for purposes of this part[22] regulations promulgated in final form or issued as temporary regulations by "the secretary" [of the Treasury Department] shall be applicable as regulations issued under this part to the extent that they do not conflict with this part or with regulations issued by the Franchise Tax Board.[23]

It might be argued that the above statute does not strictly apply to the explanations set forth in the preamble to regulations. However, courts routinely consider agency interpretations set forth in the preamble to regulations. (See, e.g., *Halo v. Yale Health Plan* (2d Cir. 2016) 819 F.3d 42, 52; *American Federation of Government Employees, AFL-CIO v. Gates* (D.C. Cir. 2007) 486 F.3d 1316, 1326.) Moreover, in *McFerrin*, *supra,* the Fifth Circuit afforded deference to the revised research and development regulations, citing *Chevron U.S.A., Inc. v. Natural Res. Def. Council, Inc.* (1984) 467 U.S. 837, 844, and it applied another provision in the preamble of

[21] Later in Treasury Decision 9104, the Treasury Department reiterated this determination by stating, in the context of discussing the exclusion for research after commercial production, that "[a]s stated above, the Treasury Department and the IRS believe that the research after commercial production exclusion (*as well as the adaptation and duplication exclusions*) do not cover research activities, including these additional clinical trials, *so long as such trials satisfy the requirements for qualified research*." [Emphasis added.]

[22] This part includes RTC section 23609, which generally conforms to section 41.

[23] See also RTC section 17024.5(d), which sets forth an identical provision in the context of the personal income tax.

T.D. 9104 which stated that the IRS would not challenge return positions consistent with the revised regulations.

On the other hand, we are cognizant of the general rule that statutes should, if possible, be interpreted in a manner that does not cause a statutory provision to have no effect.[24] Also, even while applying T.D. 9104, courts have separately discussed the exclusions set forth in Sections 41(d)(4)(A), (B) and (C).[25]

Therefore, we will address whether the adaptation exclusion or the duplication exclusion applies to the Mosque Project. The examples in Treasury Regulation section 1.41-4 provide guidance.

Treasury Regulation section 1.41-4(c)(10), Example 6, describes a rail car manufacturer that, at the request of a customer, modifies an existing rail car design in order to reduce the number of seats and provide higher quality seating material and carpet that are commercially available. The regulation concludes that the modified rail car is "merely an adaptation of an existing business component that did not require a process of experimentation."

Treasury Regulation section 1.41-4(c)(10), Example 8, provides an example in which the taxpayer seeks to develop a new gasoline additive. To develop its additive, the taxpayer first analyzes and reproduces ingredients used by another manufacturer in producing a gasoline additive. The regulation provides that the taxpayer's activities in analyzing and reproducing the ingredients involve the duplication of existing components under section 41(d)(4)(C) and therefore do not constitute qualified research. However, the taxpayer's experimentation activities to develop potential alternative formulations do not involve the duplication of an existing business component (and therefore are not disqualified by section 41(d)(4)(C)'s exclusion of projects that duplicate existing business components).

Here, we find that WSI's engineering and design process for the Mosque Project created a substantially new business component, rather than merely modifying an existing business

[24] See, e.g., *People v. Valencia* (2017) 3 Cal.5th 347, 381-382 [stating that the court "generally strive[s]" to avoid a construction that causes a provision to constitute surplusage but noting that "the canon against surplusage is a guide to statutory interpretation and is not invariably controlling"].

[25] See *Union Carbide*, *supra*, T.C. Memo. 2009-50 [applying T.D. 9104 but also considering the exclusion under Section 41(d)(4)(A), even after the court had determined that the activities otherwise satisfied the requirements for qualified research]; *Trinity I*, *supra*, 691 F.Supp.2d at p. 697, fn. 11 [stating as an "alternative" holding that claimed research activities were excluded as adapting an existing business component to a particular customer's needs].

component. Unlike removing seats from a rail car design or adding higher quality seating material to a rail car, the process of designing model mosques, to be used for military training purposes and shipped over the roads using modular construction technology, involved substantial design uncertainties and extensive modeling to determine the appropriate design. Similarly, one cannot view the pictures and drawings for the Mosque Project and determine that the project merely sought to duplicate a prior project. Indeed, appellants provided credible testimony that WSI had not previously created mosque structures prior to the Mosque Project. Unlike the process of duplicating an existing chemical ingredient, the process of designing the Mosque Project had to integrate several novel and unique features in order to produce a substantially new business component.

It is true that WSI used existing technologies as part of its process of designing and modeling the Mosque Project. But this could also be said of virtually any research project, including the ships in *Trinity I, supra*, for which the court found that the taxpayer conducted qualified research. The duplication and adaptation exclusions do not require that the taxpayer start from scratch.

In sum, T.D. 9104 suggests that the duplication and adaptation exclusions need not be considered if the Mosque Project otherwise satisfies the requirements for qualified research. In any event, we find that the Mosque Project does not merely adapt or duplicate an existing business component.

HOLDINGS

With respect to the Mosque Project, appellants have satisfied their burden of proving that WSI's activities constituted qualified research activities under Section 41(d)(1) and are not excluded from the research credit as adaptation of an existing business component under Section 41(d)(4)(B) or duplication of an existing business component under Section 41(d)(4)(C). However, with respect to the remaining sample projects, appellants have not satisfied their burden of proving that WSI's activities constituted qualified research activities under Section 41(d)(1).[26]

[26] As a result, we need not consider whether the exclusions under Section 41(d)(4)(B) or (C) apply.

DISPOSITION

FTB's actions are modified to reflect our determination that WSI's claimed research activities for the Mosque Project constitute qualified research activities, but are otherwise sustained. In accordance with the agreement of the parties, FTB will modify its actions to reflect this determination.

DocuSigned by:
Grant S. Thompson
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Grant S. Thompson
Administrative Law Judge

We concur:

DocuSigned by:
CA2E033C0906484...

Douglas Bramhall
Administrative Law Judge

DocuSigned by:
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Linda C. Cheng
Administrative Law Judge