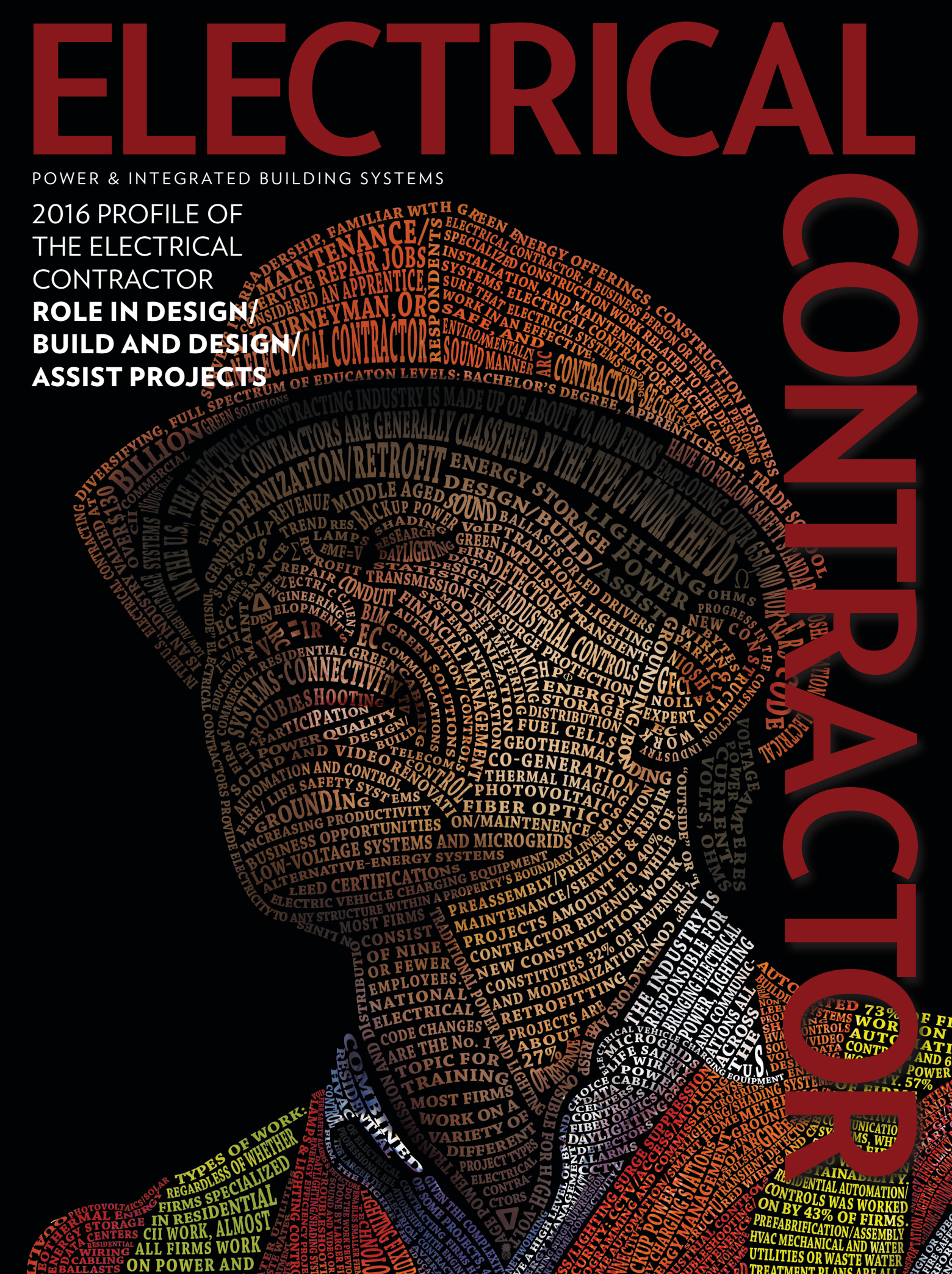
# ELECTRICAL CONTRACTOR

POWER & INTEGRATED BUILDING SYSTEMS

## 2016 PROFILE OF THE ELECTRICAL CONTRACTOR

**ROLE IN DESIGN/BUILD AND DESIGN/ASSIST PROJECTS**



**2016 "ELECTRICAL CONTRACTOR Magazine Profile"**
**Database Report**

# Electrical Contractors:
# Their Key and Evolving Role in Design/Build//Design/Assist Projects

**A Special Report Prepared by**
**Renaissance Research & Consulting, Inc.**

**For:**

**©ELECTRICAL CONTRACTOR Magazine**
**Bethesda MD 20814**
**March 2017**

## TABLE OF CONTENTS

## KEY FINDINGS

Overall, almost three-quarters of electrical contractors perform (Any) Design/Build or Design Assist work (73%). On average, Design Build or Assist accounts for an average of 43% of revenue among the total sample.

Companies of all sizes work on a Design/Build or Assist basis, but in a continuation of what was reported since 2007 (in the 2008 Profile Study), larger firms (10+) are even more likely to work on a D/B or D/A basis compared with smaller firms (1-4 or 5-9 employees). Firms with 1-4 employees are least likely to work on this basis.

However, compared to two years ago, the percentage of firms working on a Design/Build or Design/Assist basis rose significantly among the total sample, driven by firms with 1-4 employees.

The percent of revenue from Design/Build or Design/Assist rose significantly from the 2014 level of 39% and marks a return to the 43% last observed in 2012 (As in the past, the vast majority continues to be done as Design/Build --32%-- rather than Design/Assist --11%)

- Average revenue from Design/Build or Design/Assist is higher among firms with 5-9 employees (compared to firms with 1- 4 employees and to firms with 20-99 employees.) Firms with 20-99 employees derive a smallest percentage of revenue from Design/build or Design Assist compared to firms with 1-19 employees. There are no other significant differences by annual revenue. This is a change from two years earlier when average revenue from DB/DA was also higher among firms with 100+ employees.

Similarly, as was the case in earlier Profile Studies, in 2016, larger firms (starting at annual sales of $250,000 and again at $1 million) are more likely than smaller firms to have performed ANY work on a Design/Build or Design/Assist basis in the previous year.

- As was the case two years ago, there is a large and significant jump in the likelihood of performing ANY Design/Build or Design/ Assist work when a firm reaches $250K in revenue and again when the firm reaches $1 million in revenue.
    - The main difference between the last three Profile study waves and those that came before is that the cut-off point is now lower – the first statistically significant jump now takes place at $250,000 rather than at $1 million or more.
        - In fact, the point at which there is a significant jump in performing ANY DB or DA work has been trending to lower revenue firms since at least 2004. This is not a stand-alone finding. As observed in the 2016
        - Profile Study Topline, smaller firms are now doing more types of work that were formerly done by larger electrical contacting firms. The threshold for many types of work is now 10+ (or even 5+) rather than 20-99 or 100+.

Whether a firm works on a D/B or D/A basis appears to have a bearing on changes in company size:

- In the 2016 Profile Study, firms that worked on a Design/Build or Design/Assist basis were about twice as likely to report an increase in the number of employees (24%) compared with firms that do not work on a D/B or D/A basis (12%). In contrast, firms that do no D/B or D/A work are statistically more likely to report staying the same (74% vs. 62%)

As has been noted in previous Design Build Breakout reports, companies that work on a Design/Build or Assist basis tend to mirror the behavior of large electrical contracting firms:

- Firms that work on a Design/Build or Design/Assist basis are more likely to work on almost all of the 30+ project types included in this study and also to work on Systems Integration and Data Centers (including Commissioning and Programming), compared with firms that do not offer design services.

- As was the case at least since 2007, firms that perform D/B or D/A work report, on average, that a higher percentage of their revenue comes from CII and a lower percentage from Residential construction, compared with firms that do not offer design services.

- In contrast, firms that **not** work on a DB or DA basis derive a significantly higher percentage of their revenue from Repair work compared to firms that offer Design/Build or Design/Assist services. This finding is consistent with the fact that smaller firms derive a larger percentage of average revenue from Repair work.

    - In addition, firms that worked on a D/B or D/A basis obtained a higher percentage of their average revenue from New Construction and from Modernization/Retrofit.

- In a related finding, *younger* respondents (who tend to work for larger firms) were significantly more likely to say that their firm works on a DB or DA basis. As has been the case since at least 2010, in the 2016 Profile Study respondents aged 18-64 are more likely than those aged 65+ to work for firms that performed (Any) Design/Build or Design/Assist work.

Firms that work on a DB or DA basis also mirror larger firms in these ways: they are significantly more likely to have a separate person or department responsible for business development, to provide project financing and to be NECA members

- In addition, firms that work on a DB/DA basis are far more likely to make use of BIM at all -- Any -- and to report using (having used or to anticipate using) BIM a higher percentage of the time.

Firms working on a Design/Build or Design/Assist basis have even more of an opportunity to make brand selections compared with firms that do not provide any Design/Build or Assist services. These findings provide further confirmation of the integral role played by those who provide design services and is another indication of the expanded responsibilities given to electrical contractors who work on a Design/Build or Design/Assist basis.

- Consistent with the results from two, four and six years ago, in 2015, electrical contractors who work on a Design/Build or Design/Assist basis say that the they receive *any* incomplete plans and specs 85% of the time, compared to a significantly lower percentage cited by those who do not work on a Design/Build or Design/Assist basis (48%).

- Also consistent with two and four years ago, electrical contractors who work on a Design/Build or Design/Assist basis estimate that an average of 45% of the plans and specs that they receive are incomplete, compared to a significantly lower percentage cited by those who do not work on a Design/Build or Design/Assist basis (30%).

Firms that work on a Design /Build or Design/Assist basis are significantly more likely than those that do not provide design services to have a (any) professional relationship with an engineer or to have a consulting relationship with an engineer. There is no difference by whether design services are offered in terms of having an engineer on staff or as a separate division or having both a consulting relationship and an engineer on staff.

- The high prevalence of working with engineers speaks to the complexity of much of the work performed by electrical contractors.

About three-quarters of electrical contractors (74%) report having a "high" (39%) or "medium" (34%) ability to influence the overall electrical design or specifications with building owners or design team members.

- Electrical contractors who work on a D/B or D/A basis are more likely than those who do not work on this basis to describe their influence as "high" (42% vs. 32%) or "medium (39% vs. 27%)" and significantly less likely to say that the "question is not applicable to them".

Across the total sample, almost two in 10 electrical contractors say that they now get involved *earlier* in the design collaboration; about 60% report *no change* and 5% say that they now get involved *later* in the process.

- Electrical contractors who work on a D/B or D/A basis are more likely than those who do not work on this basis to say that they get involved "earlier" (19% vs. 8%); there is no difference in terms of those reporting "no change" or getting involved "later" compared with 3 – 5 years ago. As was the case two years ago, firms that work on a D/B or D/A basis are far less likely to say that the question is "not applicable" to them.

Brand Choices: "Availability" and "Price" emerge as the top reasons regardless of Design/Build or Design/Assist status. "Compatibility with Existing Systems", which was added in the 2014 Profile Study emerged as the third most-mentioned reason, again, without regard to whether the firm works on a DB or DA basis or not. These findings pertain to top reasons for original brand selection and for top reasons for brand substitution and mirror findings from the 2014 Profile Study.

Training: there is no difference in having taken training within the past 12 months or seeking training within the next 12 months[1] based by whether or not a firm offers design services. This is a change from 2014 rofile findings when firms that offered design services were more likely to plan to seek training within the *next* 12 months but were equally likely to have taken *past* 12 month training.

- Sources: Frms that offer design services are more likely than those who do not work in this way to seek training from manufacturers; firms offering design services are more likley than firms that do not work in this way to seek certification from organiations.

Course topics: The following courses are more likely to be cited by those who work on a Design/Build or Design/Assist basis than those who do not work this way.[2]

- Course topics of a technical nature: Fire/Life Safety Systems, Lighting (Net) and Lighting Design, Safety (Electrical/Personal/On-site/Jobsite); Green: Community Solar, Green: Energy Use Regulations, Power Quality, Design/Build, Electrical System Design or BIM, Systems Integration, Line Work, Collaborative Building, Pre-Fab/Off-Site Building

- Course topics of a business-oriented nature: Estimating/Financial Management and How to Use New Software

[1] In the 2016 Profile Study, the periods of past 12 months and next 12 months were combined

[2] In the 2016 Profile Study, the periods of past 12 months and next 12 months were combined

## Design Build As the Primary Source of Revenue

Design/Build or Assist projects are the ***primary*** source of revenue for 34% of electrical contractors, a statistical increase from two years ago when it was 30% and a return to the 34% recorded four years ago.

- On average, Design/Build or Design/Assist work accounts for a whopping 84% of revenue for electrical contractors who work *primarily* on a Design/Build basis and is statistically unchanged since the 2006 Profile Study.

In the descriptions and findings to follow -- as noted in earlier reports -- the profile of those who work ***primarily*** on a Design/Build or Design Assist basis continues to change, possibly suggesting that this is a niche that offers different opportunities at different points in time:

- In 2015 (the current wave), there was only one difference by company size in the likelihood to work ***primarily*** on a Design/Build or Design/Assist basis. Specifically, firms with 1-9 employees are significantly more likely than firms of any other size to work primarily on Design/Build or Design/Assist projects. Firms with 20-99 employees are least likely to work ***primarily*** on a Design/Build or Design/Assist basis.

- There was only one significant difference by annual revenue. Firms with annual revenue of $10 million or higher are *least* likely to work ***primarily*** on a Design/Build or Design/Assist basis in 2015. In 2013 as in 2011, firms with revenues of between $250K and just under $1 million were *most* likely to work ***primarily*** on a DB/DA basis.

- Perhaps because they are on average slightly older, electrical contractors that work ***primarily*** on a DB/DA basis are also less likely t have attended college compared to those who work for firms where DB/DA accounts for less than one half of the firm's revenue (Any college: 54% vs. 58%; Bachelor's degree: 14% vs. 18%). In contrast, two years ago, respondents who attended college were significantly more likely to work for firms that worked ***primarily*** on a DB/DA basis rather than those where DB/DA accounts for less than 50% of revenue (62% vs. 57%). In contrast, in 2012, there were no differences by educational attainment on this measure.

## Design Build As the Primary Source of Revenue, continued

In terms of specifications, there are relatively few differences between firms that work ***primarily*** on a Design/Build or Design/Assist basis and those where design services account for less than 50% of the firm's revenue. The main difference is that Firms that work primarily on a DB/DA basis report a higher percentage of incomplete Single Family plans and specs compared with firms >50% but there is no difference on including CII, Multi-family Residential, Line Work or Power Generating Plants/Substations

- This is in contrast to earlier years were more differences were observed.

Regardless of whether the firm offering design services works ***primarily*** on a DB or DA basis or not, they are equally likely to have a high (39% on average) or medium (35% on average) ability to influence the electrical design with building owners/other design team members. Two years ago, they reported a vastly higher ability to influene plans and specs.

As was the case two years ago, firms that work ***primarily*** on a DB/DA basis have a footprint that is deep rather than wide compared with firms where DB/DA accounts 1-50% of revenue.

In 2015, firms that work ***primarily*** on a DB/DA basis…

- Are slightly, but significantly, *less* likely to work 28 of the 41 project types including including all aspects of Power and Lighting, all aspects of Power Quality, most aspects of Communications and Connectivity and a number of aspects of Automation/Controls and a number of aspects of Sustainability (was called "Green" in 2014)
    - Nevertheless, 52% of firms that work ***primarily*** on a DB or DA basis report working on 12 or more of the 36 project types compared with 63% of firms where DB /DA accounts for less than half of their revenue.
        - Are more likely to work in 1 –3 of the broad categories such as Green or Automation rather than in 4+ categories compared with firms that work on a DB or DA basis but where DB/DA accounts for less than half of their revenue.

## Design Build As the Primary Source of Revenue, continued

By Building Type: In 2015, compared with firms that do Design/Build or Design/Assist work, but not as their primary source of revenue, firms that work ***primarily*** on a DB/DA basis are *more* likely to (do ANY) work on Residential projects, particularly Single-Family housing[3]. This difference also emerged in 2013 but was not evident in 2011.

- In contrast, compared with firms that do Design/Build or Design/Assist work, but not as their primary source of revenue, firms that work ***primarily*** on a DB/DA basis are *less* likely to do all aspects of CII work: Commercial, Industrial and Institutional. This was also the case two years and four years ago. In addition, in 2015, firms that work ***primarily*** on a DB/DA basis are *less* likely to do Non-Building work including Utility work such as Transportation Lighting and Communications, Power Generating and Substations, Distributed Generation/Alternative Energy, Line work and/or Smart Grid Technology.

The **mean** revenue results generally follow the patterns of types of work performed. Firms that work ***primarily*** on a DB/DA basis receive a slightly, but significantly higher average percent of revenue from Residential projects, particularly from Single-Family housing work but lower average revenue from CII, particularly Commercial and Institutional projects. The higher mean revenue from Industrial work, which was observed in 2013 and 2011 was not evident in 2015, where there was no difference.

Firms that work ***primarily*** on a DB/DA basis receive a slightly, but significantly lower average percent of revenue from Non-Building work including Utility, Transportation Lighting and Communications and Power Generating Plants and Substations.

By Sector: Compared with firms where DB or DA accounts for between 1-50% of revenue, firms working ***primarily*** on a DB or DA basis are ***less*** likely to have done (ANY) work in three of the sectors (New Construction, Modernization/Retrofit and Maintenance Done Under Contract); there is no difference in the case of doing Repair work or Maintenance not done under contract. [T33]

The 2015 results are consistent with 2013 in terms of lower participation in New Construction and Modernization/Retrofit.

The **mean** revenue results do not closely follow the patterns of types of work performed except in the ase of New Construction. By Sector: Compared with firms where DB or DA accounts for between 1-50% of revenue, firms working ***primarily*** on a DB or DA basis are *less* likely to have done any work in four of the sectors (New Construction, Modernization/Retrofit, Repair and Maintenance Done Under Contract); there is no difference in the case of doing Maintenance not done under contract.

In this case, the **mean** revenue results do not closely follow the patterns of types of work performed. Mean revenue from Repair work and Maintenance not done under contract is higher for firms working ***primarily*** on a DB or DA basis. However, as might be expected based on the "any" work results discussed above, mean revenue is lower for New Construction. The mean results are generally consistent with those from 2011.

[3] But less likely to work on Multi-Family housing

## Design/Build As the *Exclusive* Source of Revenue

In the 2016 Profile Study, Design/Build or Assist projects are the ***exclusive*** source of revenue for 13% of electrical contractors. This is a statistically significant increase from two years when it was 10%. In fact, about 10% of electrical contractors have worked exclusively on a DB/DA basis since 2008. The large sample size (2722) in the 2014 Profile Study afforded the opportunity for some further analysis of this sub-group. However, the additional analysis will be limited to "core" questions that were asked of all respondents, rather than those asked in only in a single version.

- As we observed two years ago, among firms that do any D/Bor D/A work, as company size shrinks, the percentage of revenue from Design/Build or Design/Assist increases:
    - Firms that work ***exclusively*** (100%) on a Design/Build or Design/Assist basis are most likely to have 1- 4 employees and revenues of <u>under</u> $250K.
        - Firms that work ***primarily*** on on a D/B or D/A basis are more likely to have 1-9 employees (compared to firms that work on a DB or DA basis but for whom design work accounts for less than one half of their revenue and are least likely to have 20-99 employees. There is only one income related skew: firms that work primarily on a DB or DA basis are less likely to have annual revenues of over $10 million.
- As the percentage of revenue from D/B or D/A increases, the average percent of revenue derived from Residential work, particularly Single-Family housing, increases, while the percent of revenue from CII projects, particularly Commercial projects, decreases.
- Similarly, as the percentage of revenue from DB or DA increases, the average percent of revenue from Repair work and Maintenance not done under contract increases and the average number of projects worked on decreases.

Older respondents, working in small firms (1-4 employees and annual revenues of under $250K) where a higher relative percentage of revenue comes from Residential projects and from Maintenance work not done under contract not only describes firms that derive 100% of their revenue from DB/DA projects but also those that do **not** offer design services.

In trying to tease out ways in which these small firms are different (DB=100% of revenue vs. DB=0%), we found that firms that work ***exclusively*** on a DB/DA basis are significantly more likely to work on Industrial Controls and CII Fire Life Safety Systems, all aspects of Power Quality, Networking (VOIP, Wireless, Broadband, etc) and many aspects of Green/Sustainable Energy. These are all areas that can be performed by more technically adept firms, even if they are small in size.

# METHODOLOGY

This report focuses on electrical contracting firms that worked on a Design/Build or Design/Assist basis in 2015. Please note that the Profile study is conducted in even years (2016 or 2014) and asks about the work performed in the previous year (2013, in this case).

The survey was conducted by postal mail and via the Internet among a random sample of ELECTRICAL CONTRACTOR subscribers. The field period for the survey began on March 3, 2016 (for both the Internet and postal mail versions), and ended on April 12, which was the deadline for the July 2016 article. A total of 2419 interviews were completed – 1062 via the Internet and 1357 via postal mail. The data were weighted to equalize the influence of the two modes so that it was in line with the 50/50 split which was the case in the most recent Profile studies.

Each respondent who received the survey via the Internet was sent three follow-up e-mails. However, follow-up mailings were not made to non-responders in the postal mail sample. An incentive was offered for participation in the survey: For each completed survey, ELECTRICAL CONTRACTOR magazine would contribute $5 to charity.

The Internet option was first introduced in 2004. In 2004 and 2006, the proportion of surveys completed via the Internet versus postal mail is approximately 60/40. Since 2008, the proportion has been closer to 50/50. As noted above, in 2014, the data were weighted to equalize the proportion that participated via postal mail and via the Internet.

In 2014, in order to accommodate a longer list of questions while at the same time lessening the burden on the respondent, the survey was shortened from 5 print pages to 4. In order to accommodate all of the questions, the survey was produced in 8 versions (up from 4). This required a much larger sample size so that each of the questions would be asked of a large enough sample to allow for analysis – particularly by subgroups. These changes provided the opportunity to increase the sample size in certain of the versions in order to provide increased statistical reliability. In 2016, a total of 7 versions of the survey were produced. For this version of the survey, the sample size was 2419 in 2016 cmpared with 2722 in 2014.

The margin of error on the total sample of 2419 is +/-**1.7**% for percentages around 50 percent (i.e., we are confident that a reported 50% will fall between **51.7**% on the plus side and **48.3**% on the minus side 90% of the time. Please note that different rules apply to testing of averages, which were also tested at the 90% level of confidence and are also noted in the report. **A significant difference in** the total sample between 2016 with a sample size of 2419 and 2014, where the sample size was 2722 is at least **1.2**% at the 90% confidence level for percentages around 50%. Any difference less than 1.2% is not statistically significant

Some of the questions were asked of only a subset of electrical contractors, on average, about 350. The confidence band around 350 is +/- 4.5% for percentages around 50 percent (i.e., we are confident that a reported 50% will fall between 54.4% on the plus side and 45.6% on the minus side 90% of the time.) Please note that different rules apply to testing of averages, which were also tested at the 90% level of confidence and are also noted in the report. The margin of error comparing two smaller bases of about 350 each (from different years) is 6%.

For this report, the estimates of market size are based on the 2014 County Business Patterns (CBP).

**This research was conducted by New York, NY-based Renaissance Research & Consulting, Inc. (www.renaiss.com), an independent marketing research firm that has, as one of its specialties, market research for the construction industry.**

# DETAILED FINDINGS

## Facts and Trends About Design/Build Work

## Who Performs Design/Build or Design/Assist Work?

### …By Number of Employees

Overall, almost three-quarters of electrical contracting firms performed Design/Build or Design/Assist work in 2015 (73%). Note that companies of all sizes work on a Design/Build or Assist basis. Larger firms are more likely to work on a DB or DA basis than are smaller firms. Specifically,

- Firms with 5-9 employees are significantly more likely to work on DB or DA basis compared with electrical contracting firms with 1-4 employees.
- Similarly, firms with 10+ employees are significantly more likely to provide DB or DA services than are firms with 1-9 employees

On average, DB or DA work accounted for 43% of revenue among the total sample. DB or DA work accounts for 56% of revenue, on average, among those who actually perform this type of work (not shown).

- Firms with 5-9 employees derive significantly more revenue on average from DB/DA work compared with firms with 1-4 employees and firms with 20-99 employees.

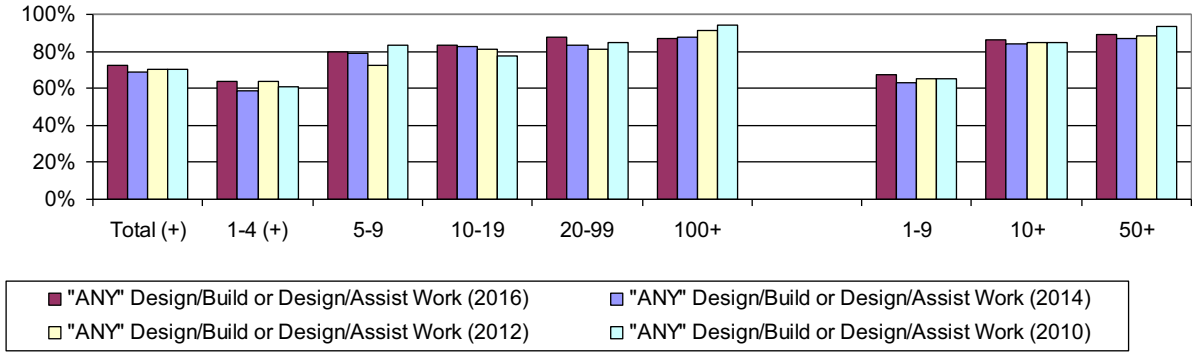
| Design Build Work in Previous Year by Number of Employees (2016 Profile Study) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | 1-4 | 5-9 | 1-9 | 10+ | 10-19 | 20-99 | 100+ |
| | (2419) | (1361) | (383) | (1744) | (665) | (223) | (269) | (173) |
| | % | % | % | % | % | % | % | % |
| **Any** Design Build Work | 73 | 64 | **<80** | 68 | **<86** | **84** | **88** | **87** |
| | | | | | | | | |
| Average Percent of DB/DA Revenue | 43 | 43 | <47 | 44> | 41 | 45 | >38 | 41 |

The 2016 findings shown below suggest a continuation of what was reported since the 2006 Profile study (only findings since the 2010 Profile Study are shown below), specifically that larger firms are significantly even more likely to work on a DB or DA basis compared with smaller firms.

- Compared to two years ago, the percentage of firms working on a Design/Build or Design/Assist basis rose significantly among the total sample, driven by firms with 1-4 employees.

- There are no other significant differences by firm size compared with two years earlier. Although the difference vs. two years earlier among firms with 20-99 employees is about 4%, this difference is not significantly different at the 90% level of confidence at an average sample size of 250.

**Firm Performed "ANY" Design/Build or Design/Assist Work in Previous Year**
**(2016 Profile Vs. 2014, 2012, and 2010 Profile Studies)**

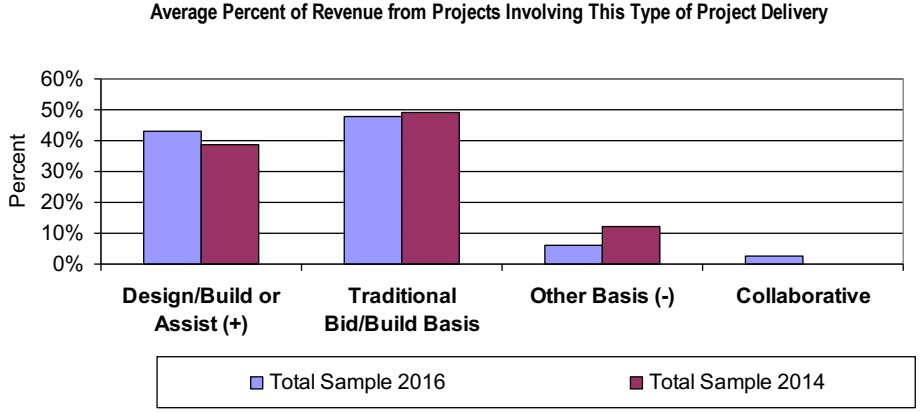



(+) Increase from 2014 results

Overall, an average of 43% of electrical contractors' revenue was done on either a Design/Build or Design/Assist basis. This is a statistically significant increase from the 2014 level of 39% and marks a return to the 43% last observed in 2012 (As in the past, the vast majority continues to be done as Design/Build --32%-- rather than Design/Assist --11%). .

About one-half of electrical contractors' revenue comes from Traditional Bid/Build projects (49%, unchanged from 2014).

- "Other delivery methods", which accounted for 6% of project delivery revenue, posted a sharp drop from its 2014 level of 12%. While 12% in 2014 may have been an outlier (it was 10% in 2012) some of the decline (from 12% to 6%) may be due to the addition a new category – collaborative building.
    - Across the total sample, Collaborative building accounts 2.7% of average revenue. It accounts for 2.2% of revenue among firms with 1-9 employees but by contrast, for a significantly higher average revenue for firms with 20-99 (3.9%) and firms with 100+ employees (5.9%). We expect the importance of collaborative building to grow in the future both among the largest firms and for it to be adopted to a greater extent by smaller firms. [Means by company size are not shown.]
        - To put this into context, across the total sample, 12% say that they have done **any** collaborative building (21% among firms with 10-19 employees and about 32% among firms with 20+ employees), again, making it an area to watch in the years to come. [**Any** collaborative building is not shown.]

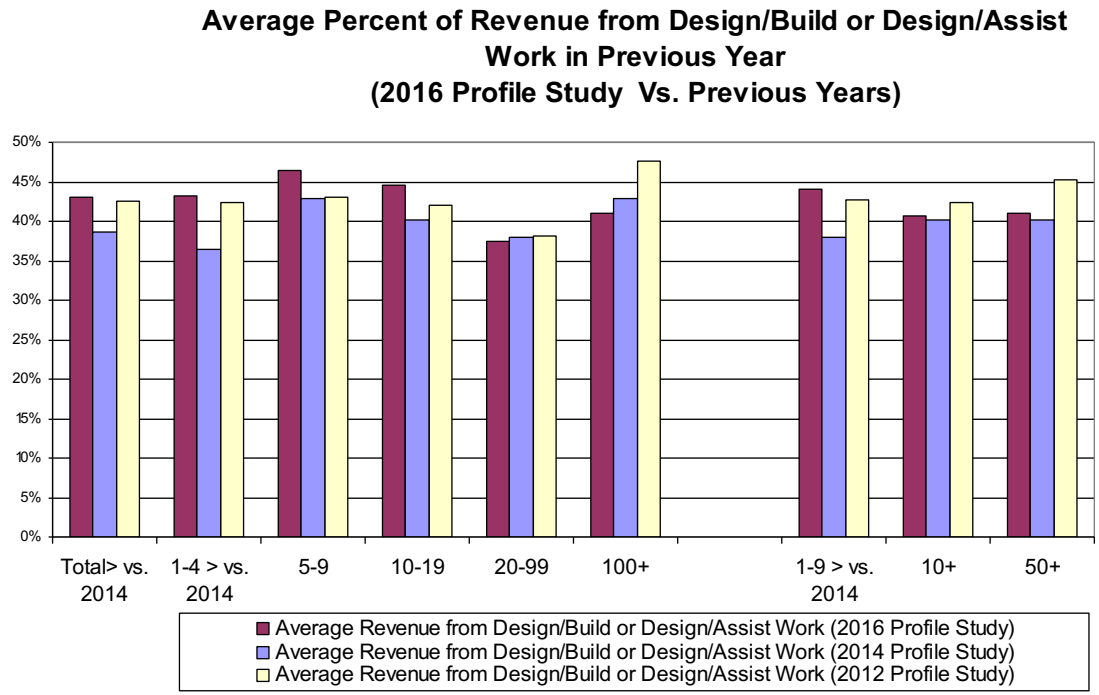



Q 9 2016 Sample = 2419 2014 Sample = 2722

(+) Indicates a significant increase vs. 2014; (-) Indicates a significant decline vs. 2014

**Table is Table 50, Pgs. 227-228**

In the 2016 Profile Study, the average percent of revenue from Design/Build or Design/Assist is significantly higher among firms with 1-9 employees (driven by firms with 1-4 employees). The base sizes of firms with 5-9 or 10-19 employees, although substantial, is not large enough for the apparent difference from 2014 to be significant.



### …By Change in Company Size During Past 12 - 18 Months

Background: Overall, about two thirds of firms say that they stayed the same in terms of number of employees over the past 12 – 18 months.

- Further, when the 2016 Profile Study is compared with the 2014 Profile results, there is a statistically significant increase in the percentage of firms that stayed the same (to 65% from 61%) and a statistically significant decrease in the percent of firms that said that they lost employees (to 13% from 18%) in the past 12 – 18 months.

Note the sharp and steady decline of firms that lost employees (decreased) between 2010 and 2016.

However, whether a firm works on a D/B or D/A basis appears to have a bearing on changes in company size:

- In the 2016 Profile Study, firms that worked on a Design/Build or Design/Assist basis were about twice as likely to report an increase in the number of employees (24%) compared with firms that do not work on a D/B or D/A basis (12%). In contrast, firms that do no D/B or D/A work are statistically more likely to report staying the same (74% vs. 62%).

- This same pattern was observed in 2014.

- In contrast, there was no difference by D/B or D/A status in 2012.

| Change in Company Size During Past 12 - 18 Months | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | | | 2016 | | 2014 | | 2012 | |
| | | | | DB or DA | | DB or DA | | DB or DA | |
| | 2016 | 2014 | 2012 | Any | None | Any | None | Any | None |
| | (2419) | (2722) | (1024) | (1740) | (547) | (1860) | (733) | (717) | (218) |
| Increased | 21% | **20%>** | 12% | **24%>** | 12% | **24%>** | 11% | = | = |
| Stayed the Same | **65%>** | 61%= | 63% | 62% | **<74%** | 56% | **<72%** | = | = |
| Decreased | **13%>** | 18% | **<24%** | 13% | 12% | 19% | 16% | = | = |

## …By Annual Revenue

- As was the case in earlier Profile Studies, in 2016, larger firms (annual sales of $250,000 and up) are more likely than smaller firms to have performed ANY work on a Design/Build or Design/ Assist basis in the previous year.
  - There is a large and significant jump in the likelihood of performing ANY Design/Build or Design/ Assist work when a firm reaches $250K in revenue and again when the firm reaches $1 million and again when it reached $10 million or more in revenue.
    - This was also the case in 2014, in 2010 but not in 2012, where the next significant jump was at $10 million +.
    - In 2008 and earlier, the *first* statistically significant jump took place at $1 million or more. In fact, the point at which there is a significant jump in performing ANY DB or DA work has been trending to lower revenue firms since at least 2004. This is another example of smaller firms performing work that was previously done only by larger firms.

| Electrical Contracting Firm Performed "ANY" Design Build or Design/Assist Work in Previous Year | | | | | | |
|---|---|---|---|---|---|---|
| | **Total** | **Under $250K** | **$250K to Under $1 Million** | **$1 Million to Under $2.5 Million** | **$2.5 Million to Under $10 Million** | **$10 Million +** |
| "ANY" Design/Build or Design/Assist Work (2016) | 73% | 61% | **<77%** | **<85%** | **86%** vs. 77% | **90%** vs. 85% |
| "ANY" Design/Build or Design/Assist Work (2014) | 69% | 57% | **<75%** | **<84%** | **84%** | **92%** vs. 84% |
| "ANY" Design/Build or Design/Assist Work (2012) | 70% | 60% | **<77%** | **84%** vs. 60% | **80%** vs. 60% | **<95%** |
| "ANY" Design/Build or Design/Assist Work (2010) | 70% | 59% | **<74%** | **<88%** | **78%** vs. 59% | **<96%** |
| "ANY" Design/Build or Design/Assist Work (2008) | 77% | 67% | = | **<85%** | **<91%** | **<90%** |
| "ANY" Design/Build or Design/Assist Work (2006) | 79% | 68% | = | **<86%** | **<90%** | **<96%** |
| "ANY" Design/Build Work (2004) | 83% | 81% | = | = | = | **<90%** |

**Bold** and < indicates significant difference at the 90% level of confidence

## Who Performs Design/Build or Design/Assist Work?

### …By Age of Respondent

Background: There is a strong relationship between the age of the respondent and the size of the firm for which he or she (usually he) works.

As noted in previous Profile Topline reports, smaller firms tend to have survey takers with an older average age. One hypothesis is that older electrical contractors may found their own -- smaller firms -- after working for others earlier in their careers.

| Respondent Age 2016 Profile Study | | | | |
|---|---|---|---|---|
| | | Firm Size | | |
| | Total | 1-4 | 1-9 | 10+ |
| | | (a) | (b) | (c) |
| Average Age (2016 Study) N=2419 | 57.3 | **58.7** | **58.5>** | 54.1 |
| Average Age (2014 Study) N=2722 | 56.2 | **57.4** | **57.1>** | 53.3 |

Given that the survey taker from larger firms tend to be several years younger than the survey taker from smaller firms and given that DB/DA work skews toward larger firms, it is not surprising that the mean age for those whose firm works on a DB or DA basis is significantly younger-- 56.6 compared with those working for firms that do *not* work on a DB or DA basis, where it is 58.5

.

| | Respondent Age 2016 Profile Study | | |
|---|---|---|---|
| | **Total** | **Do "ANY" Design/Build Work** | **Do No Design/Build Work** |
| | (2419) | (1740) | (547) |
| **Mean Age (2016)** | 57.3 | 56.6 | **<58.5** |
| | (2722) | (1860) | (733) |
| **Mean Age (2014)** | 56.2 | 55.4 | **<57.3** |

**Bold** indicates that the percentage shown for this firm size is significantly larger than its reciprocal** at the 90% level of confidence

** Examples of reciprocals: If the total is composed of A+B, the reciprocal of A is B. If total = A+ B+ C, the reciprocal of A is B+C

## Who Performs Design/Build or Design/Assist Work?

### …By Age of Respondent (Trended)

As has been the case since at least 2010, in the 2016 Profile Study respondents aged 18-64 are more likely than those aged 65+ to work for firms that performed (Any) Design/Build or Design/Assist work.

| Electrical Contracting Firm Performed "ANY" Design Build or Design/Assist Work in Previous Year By Age of Survey Respondent | | | | | | |
|---|---|---|---|---|---|---|
| | **Total** | **18-34** | **35-44** | **45-54** | **55-64** | **65+** |
| | % | % | % | % | % | % |
| "ANY" Design/Build or Design/Assist Work (2016) | 73 | **75 vs. 63** | **78** | **79>** | **74>** | **63** |
| "ANY" Design/Build or Design/Assist Work (2014) | 69 | **77 vs. 59** | **77>** | **71** | **70>** | **59** |
| "ANY" Design/Build or Design/Assist Work (2012) | 70 | **92>** | **80** | **78>** | **71>** | **51** |
| "ANY" Design/Build or Design/Assist Work (2010) | 70 | **76 vs. 55** | **77** | **71** | **73>** | **55** |

### …By Respondent Education

57% of survey respondents have some college education. In 2016, in contrast to what we found in the 2014 Profile Study, survey respondents from firms that perform work on a Design/Build or Design/Assist basis are **not** more likely to be college educated. In fact, there are no differences in highest level of education attained between those whose firms who do or do not work on a DB/DA basis. (Not shown.)

### …By Level of Responsibility

79% of the sample is composed of company owners and top management, 10% say that they are Master Electricians or the Equivalent Title, 4% are project managers, 2% are field managers and 3% say that they have another title. As was the case two years ago, a slight, but significantly higher percentage of respondents who work for firms that do ANY work on a Design/Build or Design/Assist basis say that they are Field Managers (2.7% vs. 1.4%). There are no other differences in level of responsibility by D/B or D/A status. [Not shown]

### …By Other Firm Characteristics: (NECA Membership, Separate HVAC or Low Voltage Divisions, Business Development and Project Financing)

- 19% of firms in this survey are NECA members, up significantly from the 2014 level of 16%. As was the case two years ago, NECA membership is significantly higher among firms that work on a DB or D/A basis. (Membership is 22% among firms that work on a DB/DA basis versus 13% among firms that do not work this way.)

- 6% of firms have a separate division that handles HVAC (7% among firms that offer design services vs. 4% among firms that do not). While 2% of firms plan to create a separate HVAC division, there is no difference between firms that work on a DB or DA basis and those who do not.

- Similarly, 10% of firms have a separate Low Voltage division (11% among firms that offer design services vs. 6% among firms that do not). While an additional 6% of firms plan to create a separate Low Voltage division, there is no difference between firms that work on a DB or DA basis and those who do not.

- 9% of firms currently offer assistance with project financing (11% among firms that offer design services vs.6% among firms that do not offer design services). Across the total sample an additional 3% plan to institute this offering. Firms working on a DB/DA basis are more likely to say that the source of their financing "depends" compared to firms that do not offer design services.

- 12% of firms have a separate person or department responsible for business development, down significantly from 20% in the 2014 Profile Study (not shown). Separate business development entities are more prevalent in firms that work on a D/B or D/A basis compared with those who do not work this way (15% vs. 5%). An additional 5% of firms plan to create this responsibility. However, there is no difference on this measure between those who work on a D/B or D/A basis and those who do not.

| | Total 2016 | Any D/B or D/A Work | No D/B or D/A Work |
|---|---|---|---|
| | (2419) | (1740) | (547) |
| | % | % | % |
| | | | |
| **Firm is a NECA Member** (Q11) | | | |
| Yes | 19 | **22>** | 13 |
| | | | |
| Q7A/B [T41] | | | |
| Separate division that handles HVAC | | | |
| Yes | 6 | **7>** | 4 |
| No | 92 | 92 | **<95** |
| But planning to create HVAC division | 2 | = | = |
| Not planning to create HVAC division | 90 | 89 | **<94** |
| | | | |
| Q7C/D [T40] | | | |
| Separate division that handles Low Voltage | | | |
| Yes | 10 | **11>** | 6 |
| No | 89 | 87 | **<93** |
| But planning to create LV division | 6 | = | = |
| Not planning to create LV division | 83 | 81 | **<88** |
| | | | |
| **Does company offer assistance with financing (Q8A/B)** [T42] | | | |
| Yes | 9 | **11>** | 6 |
| No | 90 | 89 | **<94** |
| But planning to offer financing assistance | 3 | = | = |
| Not planning to offer financing assistance | 87 | 86 | **<91** |
| | | | |
| Source of Financing (Q8C) [T43] | | | |
| 3rd party | 39 | = | = |
| Not 3rd party | 29 | 25 | **<49** |
| It depends | 31 | **36>** | **10** |
| | | | |
| **Separate person or department (V1/2, 5) responsible for business development? [T63]** | | | |
| Yes | 12 | **15>** | 5 |
| No | 87 | 85 | **<95** |
| But planning to create in 12-18 months | 5 | = | = |
| Not planning to create | 82 | 79 | **<91** |
| | | | |

**Bolded numbers** > and < indicate statistically significant differences in the direction of the arrow.

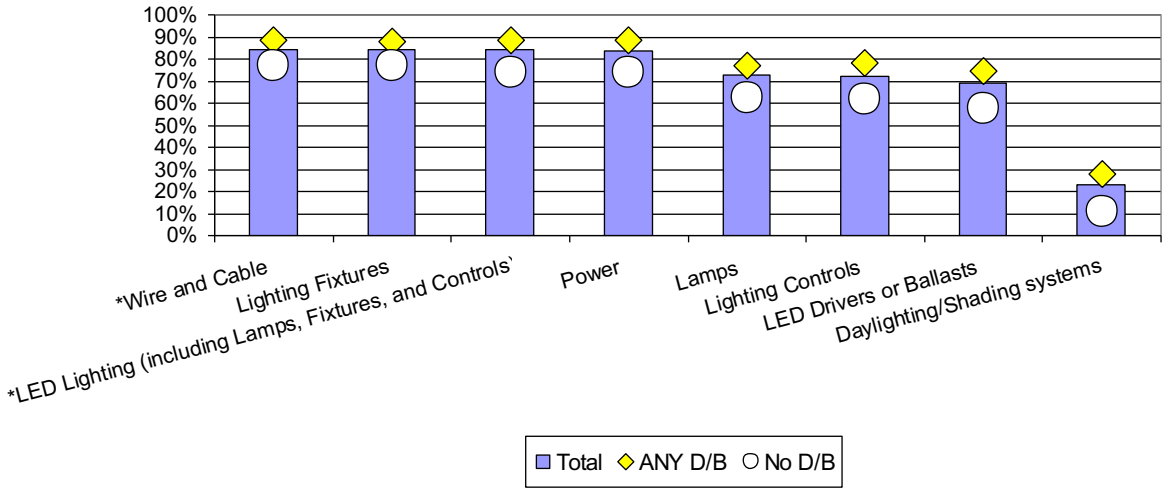
## Types of Work Performed
### …By Categories: Power and Lighting

In 2016, electrical contracting firms that worked on a Design/Build or Design/Assist basis in the previous year (2015) were…

- Significantly more likely to have worked in each of the aspects of Power and Lighting. This was also the case in the 2014 and 2012. [Earlier years are not shown.]

**Types of Work Performed in Previous Year: Power and Lighting**
**(2016 Profile Study)**

**(All of the differences shown below -- between those who perform D/B or D/A work and those who do not-- are significant at the 90% confidence level)**



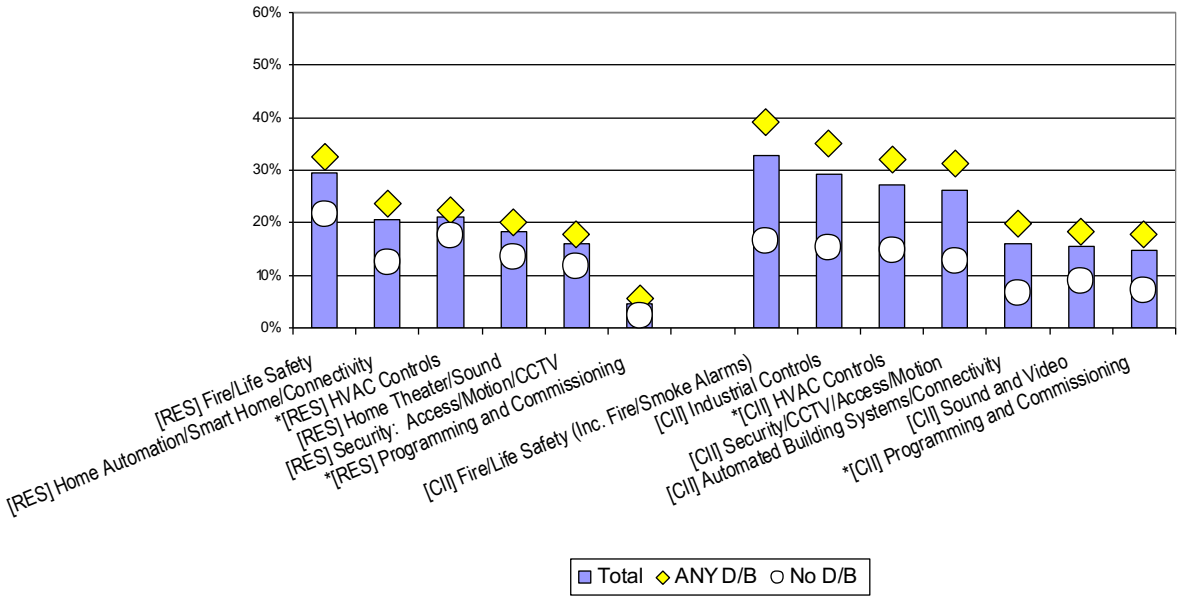

* Added in the 2016 Profile Study

## Types of Work Performed
## …By Categories: Automation/Controls Systems

Electrical contracting firms that worked on a Design/Build or Design/Assist basis in 2015 were…

- Significantly more likely to have worked in *all* of the aspects of **CII** Automation/Controls and *all* of the aspects of **Residential** Automation/Controls than those who did no Design/Build or Design/Assist work in 2015. [Note: This category is reported *separately* for Residential and CII because slightly different project types were asked by building type. For example, Industrial Controls was not asked in the case of Residential construction nor was Home Automation asked of those who work only in CII.]
  - This was also the case two years ago, reporting on 2013[4] [Earlier years are not shown.]

**Types of Work Performed in Previous Year:**
**Automation/Controls-- CII and Residential**
**(2016 Profile Study)**
**(All differences shown are significant at the 90% confidence level)**




* Added in the 2016 Profile Study

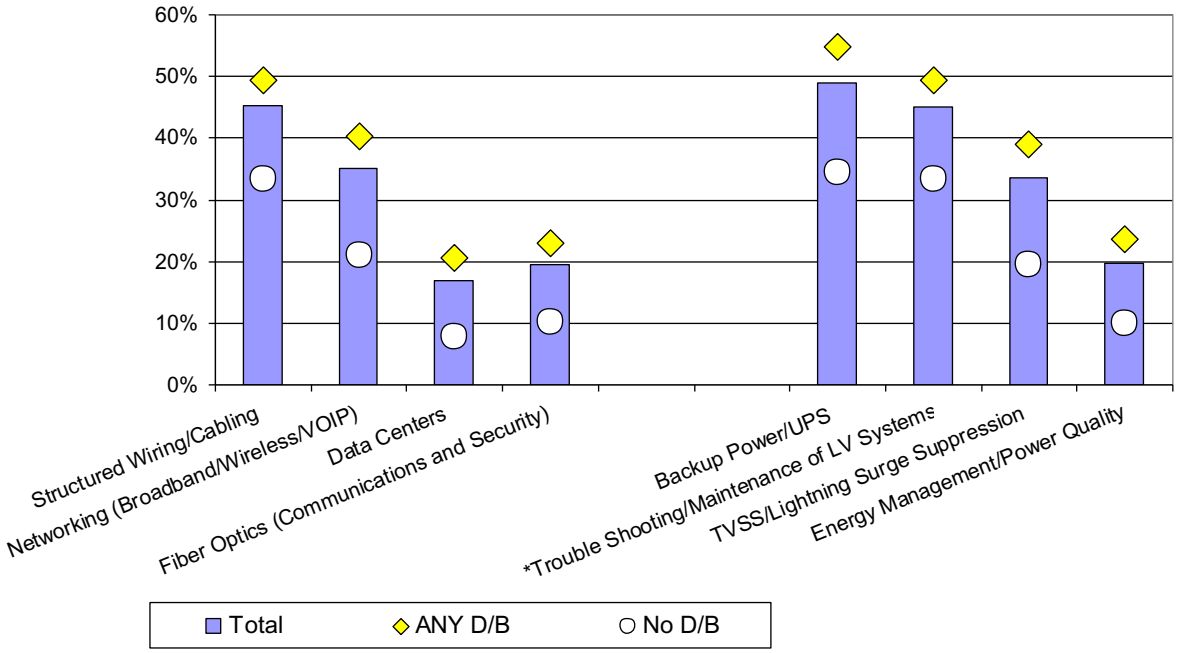
[4] Two new project types were added to Automation/Controls in the 2016 Profile Study: Programming and Commissioning and HVAC Controls

## Types of Work Performed
## …By Categories: Communications Systems/Connectivity and Power Quality

Electrical contracting firms that worked on a Design/Build or Design/Assist basis in 2015 were…

- Significantly more likely to have worked in all aspects of Communications Systems and Connectivity and Power Quality than those who do **not** work on a Design/Build or Design/Assist basis.
    - This was also the case in each of the Profile Studies from 2006 – 2014 (reporting on the years 2005 – 2013) for the aspects that were asked in those years (earlier years not shown).

**Types of Work Performed in Previous Year:**
**Communications Systems/Connectivity and Power Quality**
**(2016 Profile Study)**
**(All differences shown are significant at the 90% confidence level)**

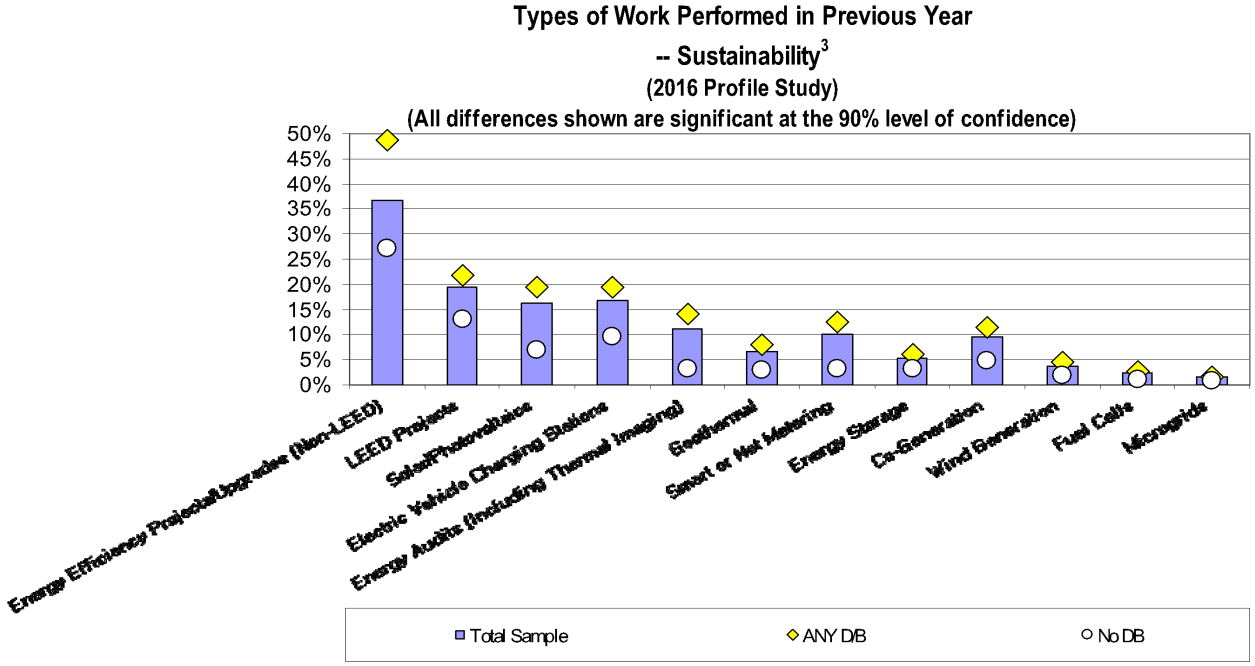


## Types of Work Performed
## …By Categories: Sustainability[5]

Electrical contracting firms that worked on a Design/Build or Design/Assist basis in 2015 were…

- Significantly more likely to have worked on almost all aspects of Sustainability[3] than those who did not do Design/Build projects. The only exception is the case of Smart Grid Technology, not shown, where there is no difference.

    - These results essentially mirror 2013 (reported in the 2014 Profile Study).



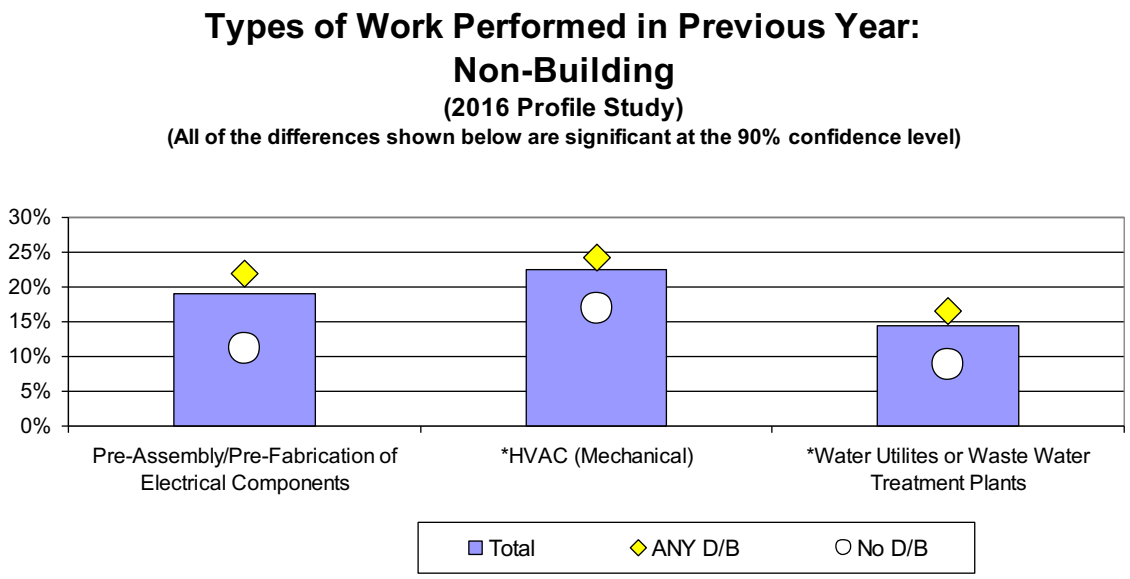

5 This category was formerly Green Building/Alternative Energy and Storage

## …By Categories: Non-Building

Electrical contracting firms that worked on a Design/Build or Design/Assist basis in 2015 were…

Significantly more likely to have worked on HVAC/ Mechanical, Pre-Assembly/Pre-Fabrication of Electrical Components, and/or Water Utilities or Waste Water Treatment Plants.

- Two years earlier, electrical contracting firms that worked on a Design/Build or Design/Assist basis were also significantly more likely to have worked on Pre-Assembly/Pre-Fabrication of Electrical Components. HVAC Mechanical and Water Utilities or Waste Water Treatment Plants were added in the 2016 Profile Study and cannot be trended.




* First asked in 2016 Profile Study

## Types of Work Performed

## Sources of Revenue
### …CII Vs. Residential

As was the case in the 2014 Profile Study, in the 2016 Profile Study, almost all electrical contracting firms that work on a Design/Build or Assist basis worked on Commercial/Industrial/Institutional (CII) projects (93% vs. 77% for firms that do not offer design/build services); 75% of electrical contractors that work on a DB or DA basis worked on Residential projects in the previous year (vs. 79% of firms that do not work on a DB or DA basis.) Involvement in non-Building work is also higher among firms working on a DB or DA basis (32% vs. 19% for firms that do not offer DB or DA services).

Again, reprising the 2014 Profile Study results, in the 2016 Profile Study, firms that work on a Design/Build or Design/Assist basis derive a significantly higher percentage of their *revenue* from *CII* work compared with electrical contractors that do **not** work on a D/B or D/A basis (55% vs.40%). In contrast, firms that do **not** perform any design services derive a significantly higher percentage of their work from *Residential* building particularly single-family housing (38% vs. 55%.) All of the differences shown below are significant at the 90% level of confidence. In *contrast* to 2014, in 2016 there is no difference in average revenue from the overall non-Building category (6%-7%). However, average revenue is significantly higher among firms working on a DB or DA basis compared to firms that do offer design/build services on Power Generation and/or Substations or on Distributed Generation/Alternative Energy).

- These findings are consistent with the fact that larger firms are even more likely than smaller firms to perform DB or DA work (and it is larger firms that are more likely to work on CII projects).
- With the exception of non-Building (where there is currently no difference), similar results emerged in at least the last four previous Profile studies.

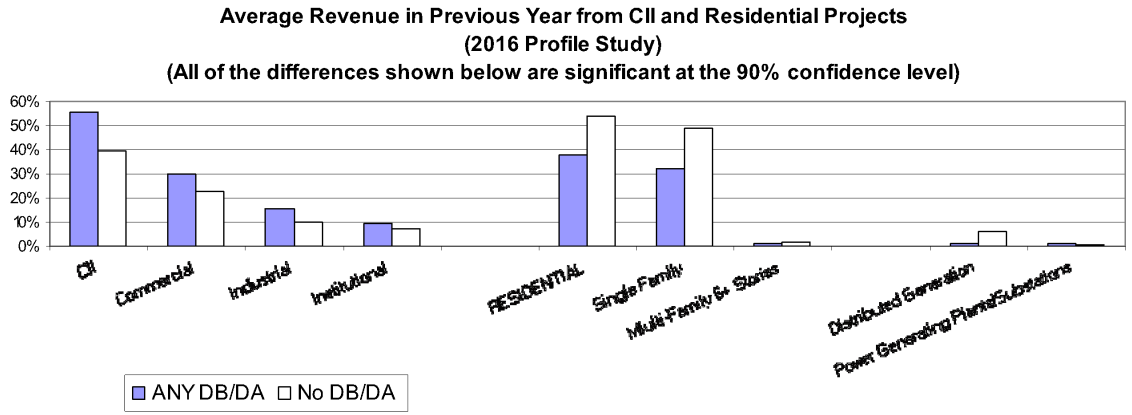



Table is Q4, Table 23 and Table 24

## Types of Work Performed

### …By Sectors (New Vs. Rehab Vs. Maintenance/Repair)

Firms that worked on a Design/Build or Design/Assist basis in 2015 were well-represented in each of the three major construction sectors. This was also the case in two, four and six years ago.

- In contrast to two and four years, ago (where there was no difference in terms of Repair), in 2015, electrical contracting firms that worked on a D/B or D/A basis in 2015 were now significantly more likely to have done work in *each* of the major construction areas: New, Modernization/Retrofit and Maintenance/Service/Repair.

**Electrical Contracting Firm Has Done "ANY" of This Work in…**

| | 2015 | | | 2013 | | | 2011 | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **Do "ANY" DB//DA Work** | **Do No DB//DA Work** | **Total** | **Do "ANY" DB//DA Work** | **Do No DB//DA Work** | **Total** | **Do "ANY" DB//DA Work** | **Do No DB//DA Work** |
| | (2419) | (1740) | (547) | (2722) | (1860) | (733) | (1024) | (717) | (218) |
| | % | % | % | % | % | % | % | % | % |
| ANY New Construction | 78 | **83>** | 68 | 77 | **84>** | 64 | 78 | **83>** | 69 |
| ANY Modernization/ Retrofit | 77 | **83>** | 65 | 76 | **82>** | 63 | 77 | **83>** | 64 |
| **ANY Maintenance/ Repair** | 89 | **91>** | 84 | 90 | **91>** | 89 | 91 | **93>** | 87 |
| Repair | 74 | **75>** | 71 | 75 | 75 | 74 | 75 | 75 | 75 |
| ANY Maintenance | 71 | **75>** | 58 | 72 | **76>** | 63 | 73 | **77>** | 61 |
| Maintenance – no contract | 57 | **61>** | 44 | 57 | **61>** | 49 | 59 | **61>** | 49 |
| Maintenance (Under Contract) | 37 | **38>** | 28 | 37 | **41>** | 27 | 37 | **41>** | 24 |

Q5 **Bold** and > indicates a significant difference at the 90% level of confidence

## …BY SECTORS (NEW VS. REHAB VS. MAINTENANCE/REPAIR), CONTINUED

In 2015, there were a number of differences between firms that worked on a Design/Build or Design/Assist compared with firms that do not offer these services in terms of **revenue**:

- Firms that work on a DB or DA basis derive significantly more revenue from New Construction, from Modernization/Retrofit work and Maintenance (not done under contract).

- In contrast, firms that do **not** work on a DB or DA basis derive a significantly higher percentage of their revenue from Repair work compared to firms that offer Design/Build or Design/Assist services. This finding is consistent with the fact that smaller firms derive a larger percentage of average revenue from Repair work.

Compared with 2013, in 2015, firms that work on a Design/Build or Design/Assist basis continue to derive a greater percentage of average revenue from New Construction and/or from Modernization/Retrofit and a smaller percentage of average revenue from Repair compared with firms that do not offer design services. (In fact, Repair work has contributed a higher percentage of average revenue to firms that do not offer design services going back to at least 2011.)

**Mean Revenue From This Work**

| | 2015 | | | 2013 | | | 2011 | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **Do "ANY" Design/Build Work** | **Do No Design/Build Work** | **Total** | **Do "ANY" Design/Build Work** | **Do No Design/ Build Work** | **Total** | **Do "ANY" D/B Work** | **Do No D/B Work** |
| | (2419) | (1740) | (547) | (2722) | (1860) | (733) | (1024) | (717) | (218) |
| | % | % | % | % | % | % | % | % | % |
| New Construction | 34 | **35>** | 30 | 32 | **35>** | 26 | 31 | = | = |
| Modernization/Retrofit | 27 | **28>** | 26 | 27 | **28>** | 26 | 27 | = | = |
| Repair | 20 | 17 | **<26** | 20 | 17 | **<26** | 21 | 18 | **<26** |
| Maintenance – No contract | 12 | **12>** | 11 | 13 | 12 | **<13** | 13 | = | = |
| Maintenance (Under Contract) | 7 | = | = | 9 | = | = | 9 | = | = |

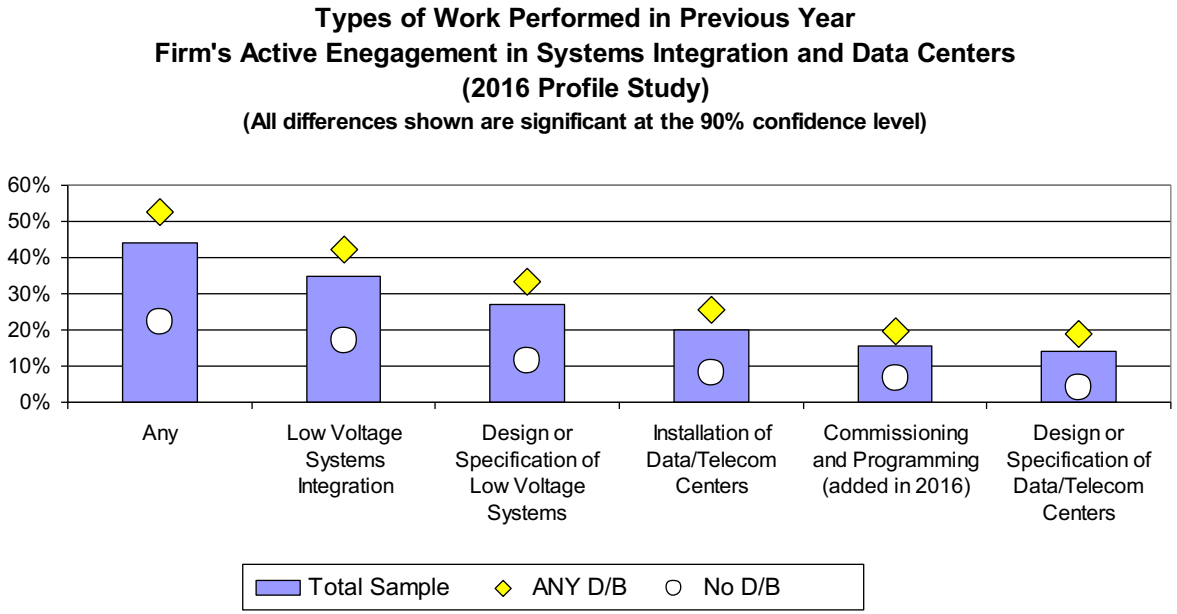
**Bold** indicates that the percentage shown for this firm size is significantly larger in the direction of the arrow.

## Types of Work Performed
## …Firms Active Engagement in Systems Integration and Data Centers

10% of firms currently have a separate low voltage division, up significantly from 7% in the 2014 Profile Study (11% among firms that work on a D/B or D/A basis, up significantly from 9% in the 2014 Profile Study vs. 6% among firms that do not work this way; no change from two years ago); an additional 6% are planning to set one up (there is no difference between firms that offer design services and those that do not on this measure.)

Electrical contracting firms that worked on a Design/Build or Design/Assist basis in 2015 were…

- Significantly even more likely to have worked in each aspect of Systems Integration and Data Centers compared with firms that do **not** work on a Design/Build or Design/Assist basis.
    - This was also the case in the four previous Profile Studies (2014, 2012, 2010 and 2008, not shown), for the systems that were tested in each of those studies.



## …Roles Played by Firm in Integrated Systems

Electrical contractors were asked to indicate the extent to which they specify, install or both specify **and** install selected integrated systems.

- A whopping seventy percent of electrical contractors that perform design/build work also both specify *and* install Lighting (including Controls) and are correspondingly less likely to install (but not specify) Lighting compared with electrical contractors that do not perform design/build work.
    - In addition to Lighting, firms that do DB work are significantly more likely to both specify *and* install Security systems: Fire/Life Safety, Security and Communications compared with firms that do not work on a DB basis.
    - In the case of Fire/Life Safety and Communications, firms that on work on a DB-DA are both more likely than those that do not offer design services to both specify *and* install or to install only.
    - In the case of Building Controls (including HVAC) and HVAC (not including controls), firms that work on a DB-DA basis are more likely than firms that do not offer design services to say that they only install.

**Roles Played by Firm in Integrated Systems**

| | **Specify *and* Install** | | | **Install *Only*** | |
|---|---|---|---|---|---|
| | **Do "ANY" Design/Build Work** | **Do No Design/Build Work** | | **Do "ANY" Design/Build Work** | **Do No Design/Build Work** |
| Version 7 Base (326) | % | % | | % | % |
| Lighting (including Controls) | **70>** | 34 | | 20 | **<38** |
| Fire/Life Safety | **28>** | 17 | | **36>** | 23 |
| Security | **21>** | 13 | | 25 | 20 |
| Communications (VDV, etc.) | **25>** | 14 | | **30>** | 19 |
| Building Controls (including HVAC) | 26 | 18 | | **33>** | 20 |
| HVAC not including Controls) | 14 | 12 | | **23>** | 15 |

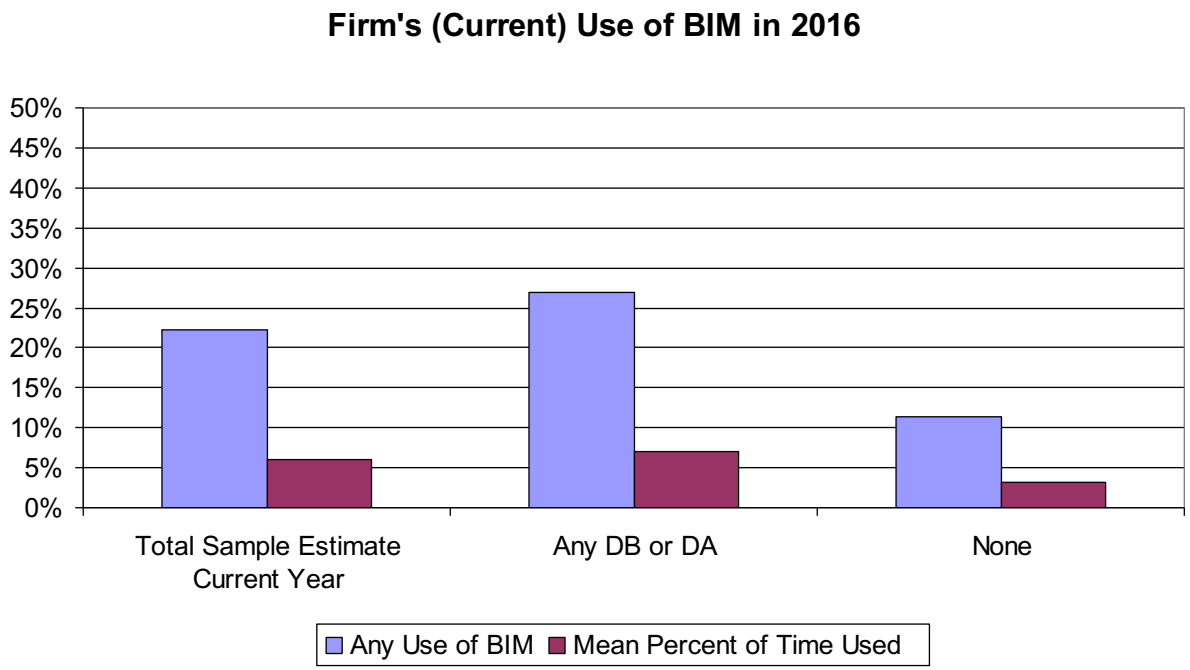
## How Contractors Perform Work

### BIM (Building Information Modeling)

Electrical contractors were asked to estimate the percentage of the time that they or someone in their firm uses BIM (Building Information Modeling) for the current year (2016).

As shown below, firms that work on a DB/DA basis are far more likely to make use of BIM at all -- Any -- and to report using BIM a higher percentage of the time.

- This was also the case in 2014 and in 2012 (earlier years are not shown).



## Specifications

### Completeness of Plans and Specs

Across the total sample, about 7 in 10 (72%) say that "any" of the plans and specs that they currently receive are incomplete. Among electrical contractors who work on a Design/Build or Design/Assist basis, the percent who say that they receive any incomplete plans and specs is 85% compared to a significantly lower percentage cited by those who do not work on a Design/Build or Design/Assist basis (48%).

- Across the total sample, electrical contractors say that they receive incomplete plans and specs on average 40% of the time. Electrical contractors who work on a Design/Build or Design/Assist basis estimate that an average of 45% of the plans and specs that they receive are incomplete compared to a significantly lower percentage cited by those who do not work on a Design/Build or Design/Assist basis (30%).

As might be expected, the incompleteness of plans and specs varies dramatically by building category. It is highest in single-family construction and declines as the level of complexity increases. Although we did not ask specifically about each of the types of CII construction, from the response below, we are assuming that the CII answer was in terms of commercial construction.

Incompleteness of plans and specs by construction type was first asked in the 2016 Profile Study and therefore cannot be trended.

## Role of Engineers within Electrical Contracting Firms

For the first time in the 2016 Profile Study, electrical contractors were asked about the professional relationship(s) that their firm has with engineers:

- Consulting Relationship
- On staff or in a separate engineering division
    - These questions were asked independently of each other since we did not want to assume that one type of relationship would rule out the other.

Across the total sample, more than four in ten (42%) of firms have a professional relationship with an engineer. While *consulting* relationships are more prevalent (38%), 15% report having an engineer on staff and/or having a separate engineering division. About one in ten firms (11%) have **both** a consulting relationship as well as having an engineer on staff or a separate engineering division. Firms that work on a Design /Build or Design/Assist basis are significantly more likely than those that do not provide design services to have a (any) professional relationship with an engineer or to have a consulting relationship with an engineer. There is no difference by whether design services are offered in terms of having an engineer on staff or as a separate division or having both a consulting relationship and an engineer on staff.

The high prevalence of working with engineers speaks to the complexity of much of the work performed by electrical contractors.

| | **Professional Relationship With Engineer(s)** | | |
|---|---|---|---|
| | | **Design Build or Design Assist** | |
| | **TOTAL** | **ANY** | **None** |
| | (326) | (221) | (88) |
| | | | |
| | % | % | % |
| Any Professional Relationship | 42 | **47>** | 33 |
| | | | |
| Consulting | 38 | **45>** | 29 |
| | | | |
| On Staff/Separate Division | 15 | = | = |
| | | | |
| Both | 11 | = | = |

## Project Collaboration/Level of Influence

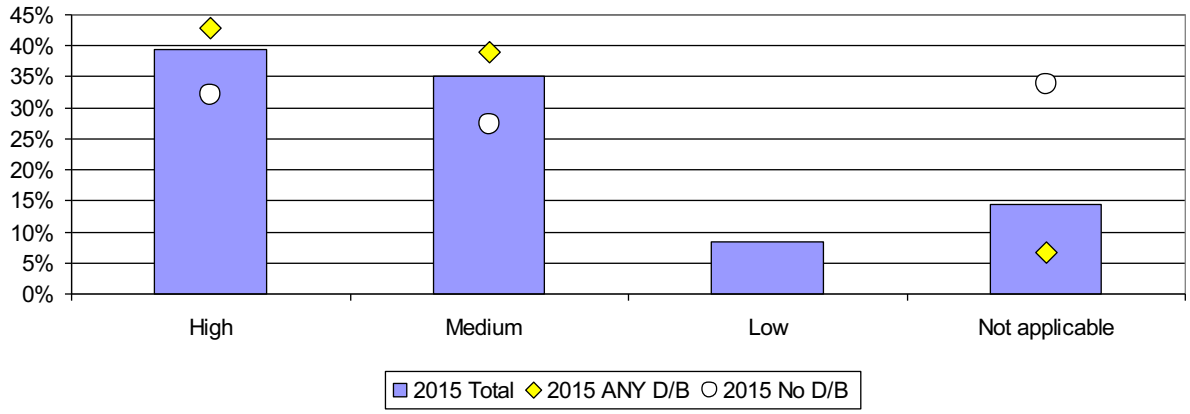
About three-quarters of electrical contractors (74%) report having a “high” or “medium” ability to influence the overall electrical design or specifications with building owners and/or design team members.

- 39% describe their level of influence as "high" while 35% characterize their level of influence as "medium."

- Electrical contractors who work on a DB or DA basis are more likely than those who do not work this way to describe their influence as “high” (42% vs. 32%) or “medium” (39% vs. 27%) and significantly less likely to say that the “question is “not applicable to them”.

    - These results are consistent with the findings from two and four years ago (not shown).

**Ability to Influence Electrical Design or Specifications**
**2016 Profile Study**
**(All differences shown are significant at the 90% confidence level)**



For the first time in the 2016 Profile Study, electrical contractors were also asked about their current level of collaboration with the following key trades: Mechanical, HVAC, Plumbing and Systems Integrator from other trades.

- Electrical contractors that work on a Design/Build or Design/Assist basis interact more than those who do not offer design services with Mechanics, with those who work in HVAC and with Systems Integrators from other trades. The level of interaction is "Medium" in the case of Mechanics and those in HVAC and either Medium or Low (but not "Not Applicable) in the case of Systems Integrators from Other Trades

| | Current Level of Project Collaboration With Selected Trades… 2016 Profile Study | | |
|---|---|---|---|
| | Total | ANY D/B Work | No D/B Work |
| | MECHANICAL | | |
| | % | % | % |
| High | 20 | = | = |
| Medium | 35 | **41>** | 21 |
| Low | 21 | = | = |
| Not Applicable | 21 | 16 | **<31** |
| | | | |
| | HVAC | | |
| High | 20 | = | = |
| Medium | 32 | **38>** | 21 |
| Low | 22 | = | = |
| Not Applicable | 21 | 16 | **<32** |
| | | | |
| | PLUMBING | | |
| High | 16 | = | = |
| Medium | 22 | = | = |
| Low | 27 | = | = |
| Not Applicable | 29 | = | = |
| | | | |
| | SYSTEMS INTEGRATOR FROM OTHER TRADES | | |
| High | 12 | = | = |
| Medium | 22 | **27>** | 12 |
| Low | 25 | **28>** | 19 |
| Not Applicable | 33 | 26 | **<50** |

Tables 199 ff

## Building Stage That Electrical Contracting Firm Gets Involved in Project Collaboration

In the 2016 Profile Study, for the first time, electrical contractors were asked at what stage their firm typically gets involved in Project Collaboration. Of those who gave a definitive answer (rather than "it depends") Pre-Construction and Construction were tied at about one-quarter each. 13% say that they get involved in the Project Design stage. Only 1% say that they get involved in Procurement.

- As shown below, there are no meaningful differences on this measure between firms that offer design services and those that do not.

| Stage the Firm Typically Gets Involved in Project Collaboration | | | |
|---|---|---|---|
| | | Work on a Design/Build or Design/Assist Basis | |
| Base: Version 7 (N=326) | Total | ANY | None |
| | (326) | (221) | (88) |
| | % | % | % |
| Project Design | 13 | = | = |
| Pre-Construction | 24 | = | = |
| Procurement | 1 | 2> | 0 |
| Construction | 23 | = | = |
| | | | |
| It depends | 35 | = | = |

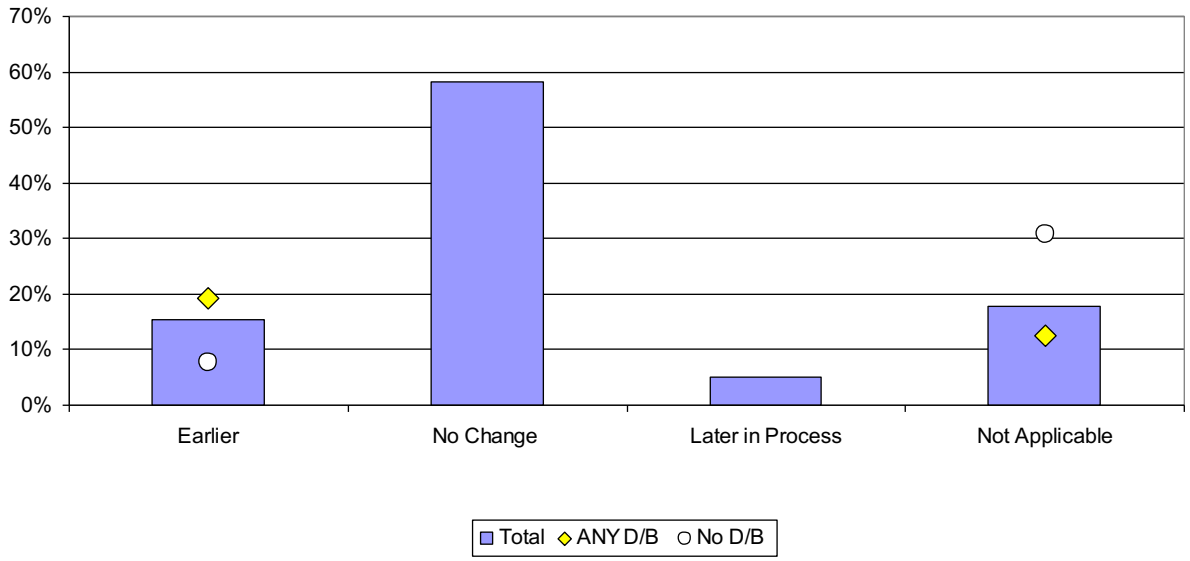
Q15c

Across the total sample, almost two in 10 electrical contractors say that they now get involved *earlier* in the design collaboration; about 60% report *no change* and 5% say that they now get involved *later* in the process. The remainder said that this question is not applicable to them or that they don't know the answer.

- Electrical contractors who work on a D/B or D/A basis are more likely than those who do not work on this basis to say that they get involved "earlier" 19% vs. 8%) than they did 3 – 5 years ago; there is no difference between the two groups in terms of "no change" or in getting involved "later." Those firms that work on a D/B or D/A basis are far less likely to say that the question is "not applicable" to them.

    - These findings are almost identical to those from the 2014 Profile Study (not shown)

**Current Level of Project Collaboration Compared With 3- 5 Years Ago**
**2016 Profile Study**
**(All differences shown below are significant at the 90% level of confidence)**




Version 7, N= 326, Table 204

## How Products are Specified

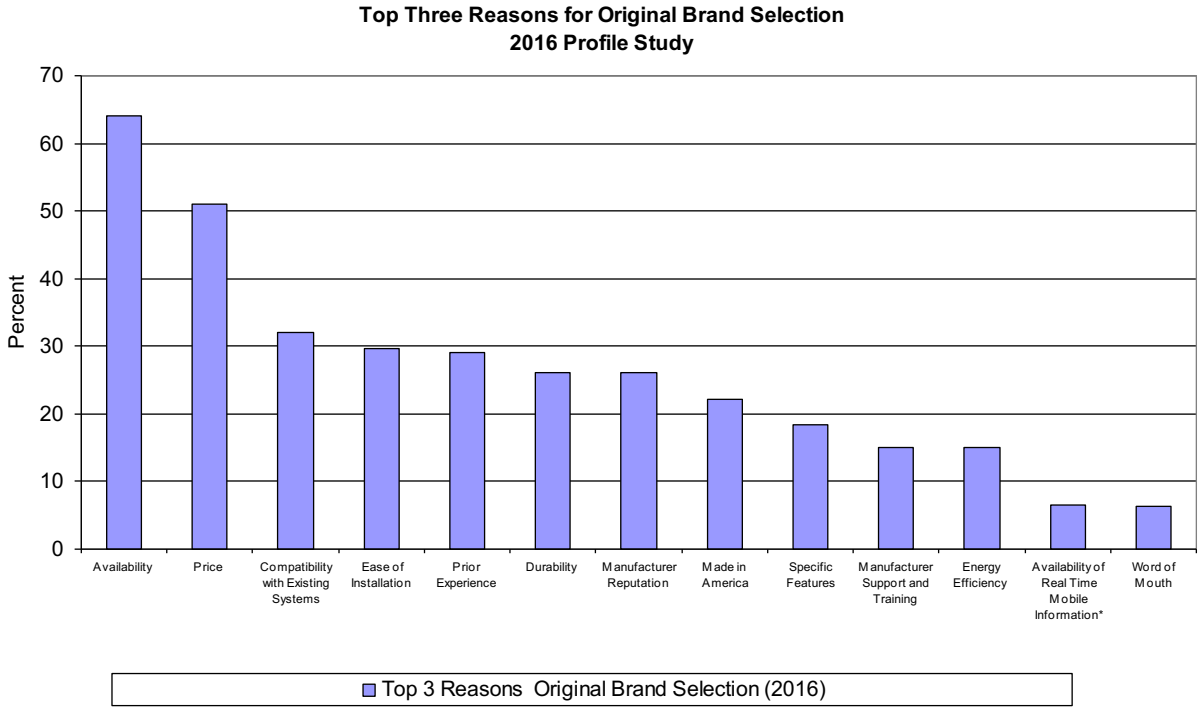
About three-quarters of the specifications given to electrical contractors are “Multiple” or “Or Equal” or “Performance Specified” which is another indication of contractors’ ability to select brands. This breakdown between single and other than single specifications has been consistent for many years.

- In the 2016 Profile Study report, there is only one difference between those firms that offer design services and those that do not offer these services -- those that work on a D/B or D/A basis are significantly more likely than those firms that do not offer design services to be given specs that are “or equal to”. In 2014 there were no differences in terms of specification by whether a firm offered design services or not (not shown).

| | Average Percent of Specifications That Are… 2016 Profile Study | | |
|---|---|---|---|
| | Total | ANY D/B Work | No D/B Work |
| Single Brand | 27% | = | = |
| Multiple Brand | 29% | = | = |
| "Or Equal To" | 29% | **31%>** | 22% |
| Performance Specified | 14% | = | = |

## Main Reasons for Original Brand Selection

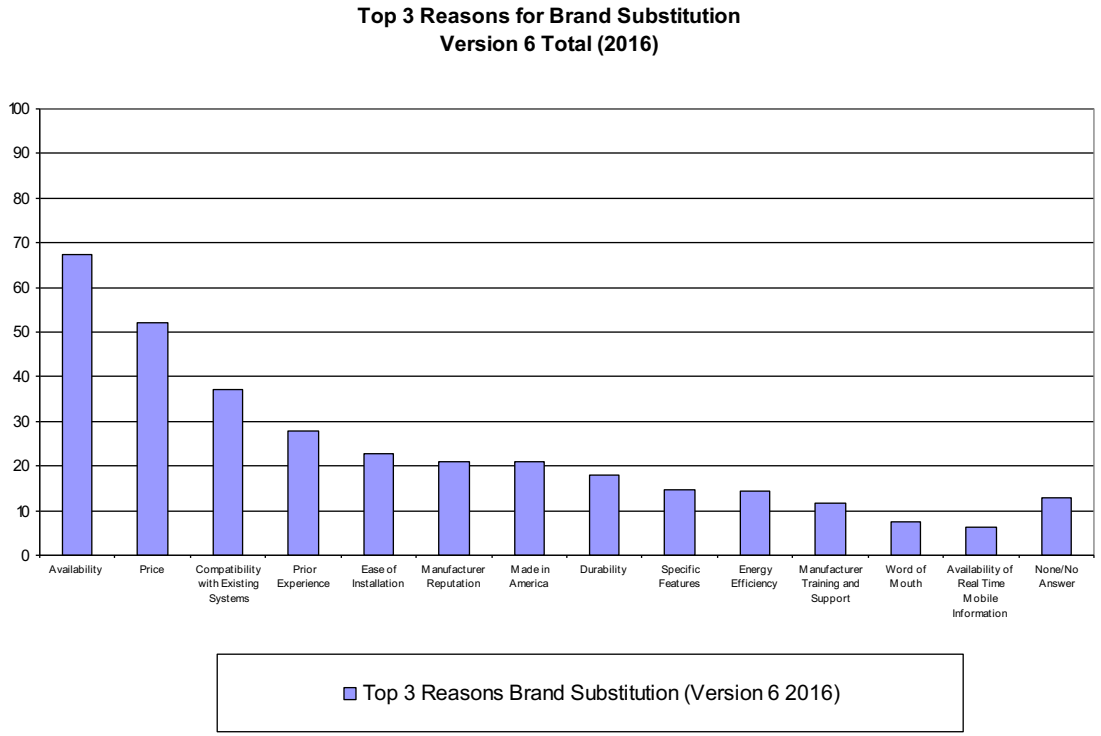
In the 2016 Profile results, (as was the case in 2014), there continues to be no difference between electrical contractors that work on a Design/Build or Design/Assist basis and those who do no Design Build or Assist work in terms of the their top 3 reasons for originally selecting a brand. "Availability" and "Price" emerge as the most important reasons regardless of whether the firm offers design services or not.




Version 6_Q16b

## Main Reasons for Brand Substitution

In the 2016 Profile results, (as was the case in 2014), there continue to be no differences between electrical contractors that work on a Design/Build or Design/Assist basis and those who do no Design Build or Assist work in terms of the their top 3 reasons for brand substitution. Once again, "Availability" and "Price emerge as the most important reasons regardless of whether the firm offers design services or not.




Version 6_Q15b

## Training (including Certification)

70% of electrical contracting firms took training in the *past* 12 months and 78% say that they plan to seek training in the *next* 12 months. There is no difference in the level of training taken or sought between firms that work on a Design/Build or Design/Assist basis compared to those that do not offer design services.

- Firms that work on a Design/Build or Design/Assist are significantly more likely to cite manufacturers as a source compared to firms that do not offer design services. There are no other differences by source of training between electrical contracting firms that work on a D/B or D/A basis compared with firms that don't offer design/build or assist services.
- Firms that work on a Design/Build or Design/Assist are significantly more likely to cite organization as a certification source compared to firms that do not offer design services. There are no other differences by source of certification between electrical contracting firms that work on a D/B or D/A basis compared with firms that don't offer design/build or assist services.

| Training Courses 2016 Profile Study | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Future Training | | | | Past Training | | |
| | Total | Do "ANY" DB Work | Do No DB Work | | Total | Do "ANY" DB Work | Do No DB Work |
| | (350) | | | | (350) | | |
| Plan to Take Training | 78% | = | = | | Not Asked | Not Asked | Not Asked |
| | | | | | | | |
| Took Training | Not Asked | Not Asked | Not Asked | | 70% | = | = |

| | Past/Future Training | | | | Past/Future Certification | | |
|---|---|---|---|---|---|---|---|
| | Total | Do "ANY" DB Work | Do No DB Work | | | Do "ANY" DB Work | Do No DB Work |
| Plan to Take or Took Training | (281) | (218) | (53)* | | | (218) | (53)* |
| Organization or Association | 56% | = | = | | 51% | **54%>** | 36% |
| Manufacturer | 39% | **44% >** | 22% | | 25% | = | = |
| Vocational or Other School | 29% | = | = | | 27% | = | = |
| All Other Sources | 13% | = | = | | 11% | = | = |

*Caution: Small Base

Course topics: The following courses are more likely to be cited by those who work on a Design/Build or Design/Assist basis than those who do not work this way.[6]

- Course topics of a technical nature:
    - Fire/Life Safety Systems, Lighting (Net) and Lighting Design, Safety (Electrical/Personal/On-site/Jobsite); Green: Energy Use Regulations, Green: Community Solar, Power Quality, Design/Build, Electrical System Design or BIM, Systems Integration, Line Work, Collaborative Building, Pre-Fab/Off-Site Building
- Course topics of a business-oriented nature:
    - Estimating/Financial Management and How to Use New Software

The full listing of courses is shown on the next page.

[6] In the 2016 Profile Study, the periods of past 12 months and next 12 months were combined

| Training – Main Focus of Course Work (2016 Profile Study) | | | |
|---|---|---|---|
| | **Total** | **ANY DB** | **No DB** |
| **Base Size of Version** | *(281)* | (218) | *(53)** |
| **Will Take/Has Taken Training** | *98%* | | |
| **And Answered Question Re: Course Work** | *(276)* | | |
| | *%* | | |
| **NEC Changes** | 71 | | |
| **AUTOMATION/CONTROLS (NET)** | 43 | | |
| **Fire / Life Safety Systems** | 23 | **26>** | *13* |
| **Automation / Controls: Home Auto Systems** | 23 | | |
| **Automation / Controls: Comm Auto Systems** | 17 | | |
| **Security Systems** | 13 | | |
| **LIGHTING (Net)** | 58 | **61>** | *46* |
| **Lighting: Controls / Systems** | 44 | | |
| **Lighting: Lamp Technology (incl uding LED)** | 39 | | |
| **Lighting: Drivers/Ballasts** | 30 | | |
| **Lighting: Lighting Design** | 26 | **29>** | *17* |
| **Grounding / Bonding** | 47 | | |
| **Safety (Electrical / Personal / On-site/Jobsite** | 42 | **45>** | *31* |
| **GREEN/SUSTAINABLE NET** | 40 | | |
| **Green: Alternative Energy Systems** | 22 | | |
| **Green: Electric Vehicle Charging Stations** | 14 | | |
| **Green: LEED Certification** | 12 | | |
| **Green: Energy Use Regulations** | 11 | **12>** | *4* |
| **Green: Community Solar** | 10 | **12>** | *2* |
| **Green: Energy Storage** | 9 | | |
| **Green: Green / Sustain Build/ Energy Audits** | 8 | | |
| **CABLING (NET)** | 33 | | |
| **Cabling: Cabling (Power)** | 24 | | |
| **Cabling: Data , Telecom (Cable, Conduit, etc.)** | 19 | | |
| **Cabling: Data and Telecom: Testing** | 16 | | |
| **Power Quality** | 19 | **21>** | *10* |
| **Electrical Testing and Maintenance** | 34 | | |
| **Estimating / Financial Management** | 19 | **22>** | *10* |
| **Design/Build** | 25 | **32>** | *2* |
| **Electrical System Design or BIM** | 22 | **26>** | *10* |
| **Developing New Business Opportunities** | 21 | | |
| **Increasing Productivity** | 17 | | |
| **How to Use New Software** | 15 | **17>** | *8* |
| **Systems Integration** | 11 | **13>** | *3* |
| **Sound and Video (Residential)** | 11 | | |
| **Sound and Video (Commercial)** | 11 | | |
| **Pre-Fab/Off-Site Building** | 10 | **12>** | *4* |
| **Renovation / MACs / Maintenance** | 9 | | |
| **Line Work** | 8 | **10>** | *2* |
| **Collaborative Building (Including IPD)** | 5 | **6>** | *-* |

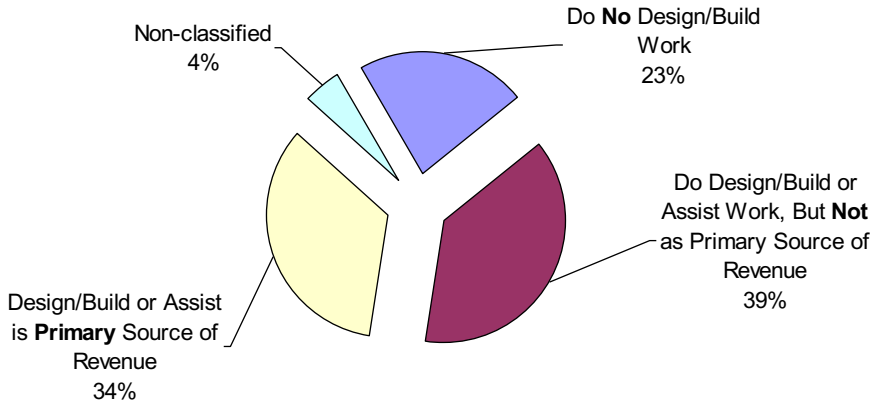
* Caution: small base
Empty cells indicate no difference between firms working on a DB or DA basis and those that do not offer design services

## WHEN DESIGN/BUILD OR DESIGN/ASSIST IS THE *PRIMARY* SOURCE OF REVENUE

In the 2016 Profile Study, Design/Build or Design/Assist projects were the ***primary*** source of revenue for 34% of electrical contractors in the previous year (2015). This is a statistical increase from two years earlier when it was 30% and a return to the levels measured in 2012, when it was 34% and in 2010, when it was 33%.

- On average, Design/Build or Design/Assist work accounts for a whopping 84% of revenue for electrical contractors who work *primarily* on a Design/Build basis and is unchanged from the findings since 2006. [Earlier results are not shown].

**Percentage of Firms Working on a Design/Build Basis: 2016 Profile Study**



## Who Works Primarily on a Design/Build or Design/Assist Basis?
### …By Age and Education

The mean age of those that work ***primarily*** on a Design/Build or Design/Assist basis is slightly, but significantly older than those who work for firms where DB/DA accounts for less than one –half of annual revenue (57.2 years old vs. 56.1 years old).

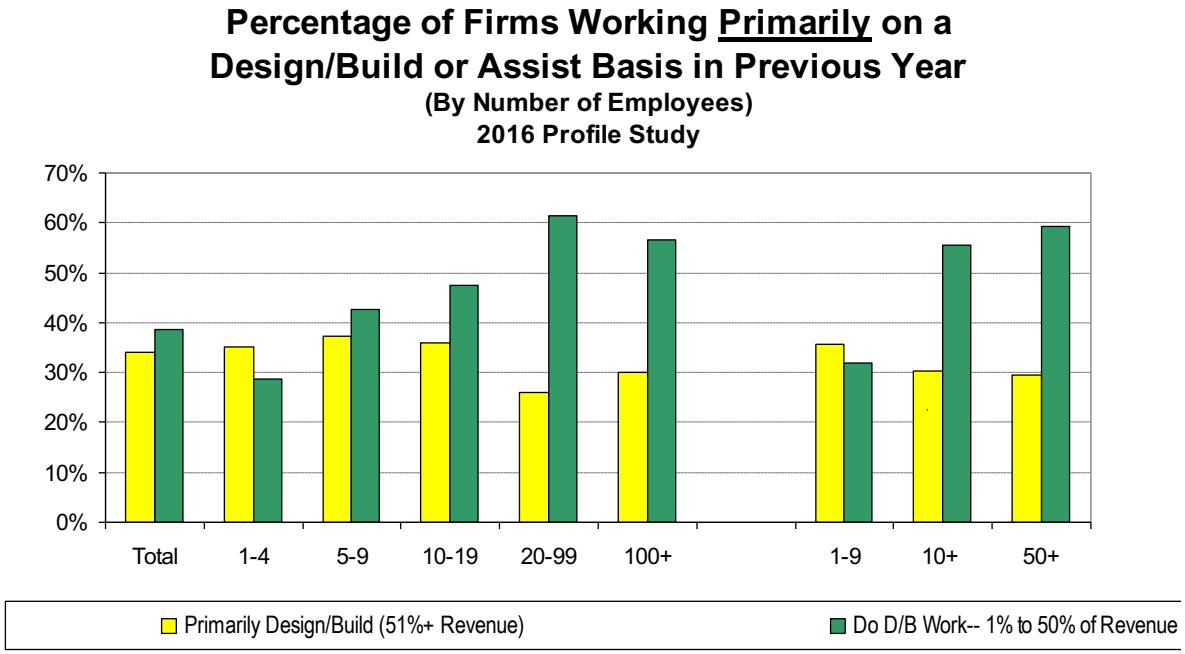
Perhaps because they are on averge slightly older, electrical contractors that work ***primarily*** on a DB/DA basis are also less likely to have attended college compared to those who work for firms where DB/DA acounts for less than one half of the firm's revenue (Any college: 54% vs. 58%; Bachelor's degree: 14% vs. 18%).

Moves around:In contrast, two years ago, respondents who attended college are significantly more likely to work for firms that work ***primarily*** on a DB/DA basis rather than those where DB/DA accounts for less than 50% of revenue (62% vs. 57%). In contrast, in 2012, there were no differences by educational attainment on this measure.

### …By Number of Employees

As shown below, with the exception of firms with 1- 4 employees, firms of all sizes are more likely to work on a Design/Build or Design/Assist basis when it accounts for less than 50% of their revenue (the green bars) than when it is their primary source of revenue (the yellow bars).

- In contrast, firms working ***primarily*** on a DB or DA basis are more likely have 1-9 employees than to be larger and less likely to have 20-99 employees.
    - Moves around: Two years ago, but **not** in the 2016 Profile Study, firms with 5-9 employees were likely than firms with 1- 4 employees to work ***primarily*** on a Design/Build or Design/Assist basis (2014 results are not shown).



## …By Annual Revenue

As noted earlier in the report, 34% of electrical contractors work ***primarily*** on a Design/Build or Design/Assist basis and an additional 39% perform D/B or D/A work but where it is not their primary source of revenue.

- In 2015, there was only one significant difference by annual revenue: firms with annual revenue of $10 million or more were significantly *less* likely than firms of other sizes to work ***primarily*** on a DB/DA basis.

- Moves around: In 2013, as was the case in 2011 (not shown), firms with between $250K and just under $1 million were *most* likely to work ***primarily*** on a DB/DA basis. In 2013, firms with revenues of under $250K are *least* likely to work ***primarily*** on a DB/DA basis.

| **PERFORM DESIGN/BUILD OR DESIGN/ASSIST WORK IN PREVIOUS YEAR (2015) (BY ANNUAL REVENUE)** | | | | | | |
|---|---|---|---|---|---|---|
| | Total | <$250K | Between $250K and $1 Million | Between $1 Million and $2.5 Million | Between $2.5 Million and $10 Million | $10 Million + |
| | (2419) | (1024) | (638) | (252) | (212) | (197) |
| ***Primarily*** D/B or D/A (51%+ Revenue) | 34% | | | | | *27%* |
| Do D/B-A Work—1% to 50% of Revenue | 39% | *27%* | | **<49%** | **55%** | **49%<63%** |
| ANY | 73% | *61%* | **<77%** | **<85%** | **86%** | **90%** |
| **PERFORM DESIGN/BUILD OR DESIGN/ASSIST WORK IN PREVIOUS YEAR (2013)** | | | | | | |
| | (2722) | (1248) | (741) | (245) | (195) | (178) |
| ***Primarily*** D/B or D/A (51%+ Revenue) | 30% | *28%* | **<34%** | | | |
| Do D/B-A Work—1% to 50% of Revenue | 39% | *29%* | **<41%** | **<54%** | **54%** | **61%** |
| ANY | 69% | *57%* | **<75%** | **<84%** | **84%** | **<92%** |

Q9 **Bold** and > indicates a significant difference at the 90% level of confidence

Note (1): Cells that are empty indicate that there is no difference in that subgroup from the total (overall average).

### …By Level of Responsibility

79% of the sample is composed of company owners and top management, 10% say that they are Master Electricians or the Equivalent Title, 4% are project managers, 2% are field managers and 3% say that they have another title. As was the case two years ago, a slightly, but significantly higher percentage of respondents who work for firms that do ANY work on a Design/Build or Design/Assist basis say that they are Field Managers (2.7% vs. 1.4%). The ec taking the survey was more likley to be a Master Electrician or Equivalent where the firm works primarily on a DB or DA basis than in firms where DB or DA accounts for less than 50% of revenue (11% vs. 8%).

### …By Other Firm Characteristics: (NECA Membership, Separate HVAC or Low Voltage Divisions, Business Development and Project Financing)

- 19% of firms in this survey are NECA members, up significantly from the 2014 level of 16%. Firms working priarily on a DB or DA basis are less likely to belong to NECA (Membership is 15% among firms that work ***primarily*** on a DB/DA basis versus 27% among firms where DB or DA accounts for less than 50% of revenue.)

- Eleven percent of firms that offer design services have a separate division that handles Low Voltage projects (lower among firms that work ***primarily*** on a DB or DA basis compared with firms where DB or DA accounts for less than 50% of revenue.)

- Eleven percent of firms that offer design services also offer assistance with project financing Across the total sample an additional 3% plan to institute this offering. Firms working primarily on a DB/DA basis are slightly but significantly more likely to say that they plan to offer financing assistance in the future.

- Firms that work ***primarily*** on a DB or DA basis are significantly more liely to have stayed the same in terms of number of employees over the past 18 months. In contrast, firms where DB or DA accunts for less than 50% of revenue are more likley to have increased or , to a less extent, to have decreased.

| | Any D/B or D/A Work | Primarily D/B or D/A Work | DB or DA Less Than 50% of Revenue |
|---|---|---|---|
| | (1740) | (818) | (922) |
| | % | % | % |
| **Firm is a NECA Member** (Q11) | | | |
| Yes | 22 | 15 | **<27** |
| Q7A/B [T41] | | | |
| Separate division that handles HVAC | | | |
| Yes | 7 | = | = |
| No | 92 | = | = |
| But planning to create HVAC division | | = | = |
| Not planning to create HVAC division | 89 | = | = |
| Q7C/D [T40] | | | |
| Separate division that handles Low Voltage | | | |
| Yes | 11 | 9 | **<12** |
| No | 87 | **89>** | 86 |
| But planning to create LV division | 6 | = | = |
| Not planning to create LV division | 81 | = | = |
| **Does company offer assistance with financing (Q8A/B)** [T42] | | | |
| Yes | 11 | = | = |
| No | 89 | = | = |
| But planning to offer financing assistance | 3 | **4>** | 3 |
| Not planning to offer financing assistance | 86 | = | = |
| | | | |
| Source of Financing (Q8C) [T43] | | | |
| 3rd party | 39 | = | = |
| Not 3rd party | 25 | = | = |
| It depends | 36 | = | = |
| **Separate person or department (V1/2, 5) responsible for business development? T63]** | | | |
| Yes | 15 | = | = |
| No | 85 | = | = |
| But planning to create in 12-18 months | 6 | = | = |
| Not planning to create | 79 | = | = |
| **Change in Number of Employees in past 18 Monts [BxB]** | | | |
| Increased | 24 | 21 | **<28** |
| Stayed the Same | 62 | **67>** | 57 |
| Decreased | 13 | 11 | **<15** |

Bolded numbers > and < indicate statistically significant differences in the direction of the arrow

Empty cells cells ind
icate no difference between firms that dervie moe than one half of their revenue from DB or DA and those for whom DB or DA accounts for between 1% and 50% of revenue

## Types of Work Performed
### …By Categories

As was noted in the 2014 Profile Design/Build//Design/Assist report, those who work ***primarily*** on a Design/Build or Assist basis appear to be specializing (working in fewer categories), compared with firms that perform DB or DA work but where it accounts for between 1% and 50% of their revenue.

- Firms that work ***primarily*** on a DB/DA basis…
    - Are slightly, but significantly, ***less*** likely to work in 28 of the 41 project types, including all aspects of Power and Lighting, all aspects of Power Quality, most aspects of Communications and Connectivity and a number of aspects of Automation/Controls and a number of aspects of Sustainability (was called "Green" in 2014)
    - There is no difference between ....on 12 of the project types. firms working primarily on a DB//DA basis are ***more*** likely than firms where DA//DB accounts for between 1% and 50% of revenue to work on Residential Programming and Commissioning.
    - Are more likely to work in 1 –3 of the broad categories* rather than in 4+ categories compared with firms that work on a DB or DA basis but where DB/DA accounts for less than half of their revenue.
- In broad strokes, this was also the case two years ago.

* Categories are the groups of project types such as Power and Lighting or Sustainability

| Types of Work Performed in Previous Year By Percent of DB/DA Revenue (2016 Profile Study) | | | | |
|---|---|---|---|---|
| Table 39 | **Total** | | Primarily DB or DA **(51%+)** | **Between 1%- 50%** |
| | (2419) | | (818) | (922) |
| | % | | | |
| **Lighting Fixtures** | 84 | | ***LO*** | **<HI** |
| **Wire and Cable** | 84 | | ***LO*** | **<HI** |
| **Power** | 84 | | ***LO*** | **<HI** |
| **LED Lighting (Including Lamps, Fixtures, and Controls)** | 84 | | ***LO*** | **<HI** |
| **Ballasts or LED Drivers** | 69 | | ***LO*** | **<HI** |
| **Lamps** | 73 | | ***LO*** | **<HI** |
| **Lighting Controls** | 72 | | ***LO*** | **<HI** |
| **Daylighting/Shading Systems** | 23 | | ***LO*** | **<HI** |
| **Backup Power/UPS** | 49 | | ***LO*** | **<HI** |
| **Trouble Shooting/Maintenance of Low Voltage Systems** | 45 | | ***LO*** | **<HI** |
| **TVSS/Lightning/Surge Suppression** | 34 | | ***LO*** | **<HI** |
| **Energy Management/Power Quality** | 20 | | ***LO*** | **<HI** |
| **Structured Wiring/Cabling** | 45 | | ***LO*** | **<HI** |
| **Networking (VOIP/Wireless/Broadband, etc.)** | 35 | | = | = |
| **Fiber Optics (Communications and Security)** | 20 | | ***LO*** | **<HI** |
| **Data Centers** | 17 | | ***LO*** | **<HI** |
| **Energy Efficiency Projects/Upgrades (non-LEED)** | 37 | | ***LO*** | **<HI** |
| **LEED Projects** | 19 | | ***LO*** | **<HI** |
| **Solar Photovoltaics** | 16 | | ***LO*** | **<HI** |
| **Electric Vehicle Charging Stations** | 17 | | ***LO*** | **<HI** |
| **Energy Audits (Including Thermal Imaging)** | 11 | | ***LO*** | **<HI** |
| **Geothermal** | 7 | | = | = |
| **Smart or Net Metering** | 10 | | ***LO*** | **<HI** |
| **Energy Storage** | 5 | | = | = |
| **Co-Generation** | 10 | | ***LO*** | **<HI** |
| **Wind Generation** | 4 | | ***LO*** | **<HI** |
| **Smart Grid Technology** | 2 | | = | = |
| **Microgrids** | 2 | | = | = |
| **Fuel Cells** | 2 | | = | = |
| **Pre-Assembly/-Fabrication of Electrical Components** | 19 | | **=** | **=** |
| **HVAC (Mechanical)** | 23 | | **=** | **=** |
| **Water Utilities or Waste Water Treatment** | 14 | | ***LO*** | **<HI** |
| **HVAC Controls** | 18 | | **=** | **=** |

| Types of Work Performed in Previous Year By Percent of DB/DA Revenue (2016 Profile Study) | | | | |
|---|---|---|---|---|
| | **Total** | | **Primarily DB or DA (51%+)** | **Between 1%- 50%** |
| | (2419) | | (818) | (922) |
| | % | | | |
| **[CII] Fire/Life Safety (including Alarms/Detectors)** | 33 | | ***LO*** | **<HI** |
| **[CII] Industrial Controls** | 29 | | **=** | **=** |
| **[CII] HVAC Controls** | 27 | | **=** | **=** |
| **[CII] Security/CCTV/Access/Motion, etc** | 26 | | ***LO*** | **<HI** |
| **[CII] Sound and Video** | 16 | | ***LO*** | **<HI** |
| **[CII] Automated Build Systems/ Connectivity** | 16 | | ***LO*** | **<HI** |
| **[CII] Programming and Commissioning** | 15 | | **=** | **=** |
| **[RES] Fire/Life Safety (incl Alarms/Detectors)** | 30 | | = | = |
| **[RES] Security/CCTV/Access/Motion, etc** | 16 | | = | = |
| **[RES] Home Automation/Smart Home/Connectivity** | 21 | | = | = |
| **[RES] HVAC Controls** | 21 | | = | = |
| **[RES] Home Theater/Sound** | 18 | | = | = |
| **[RES] Programming and Commissioning** | 5 | | **HI>** | ***LO*** |
| **Mentioned 1-9 Types** | 36 | | **HI>** | ***LO*** |
| **Mentioned 10-11 Types** | 13 | | = | = |
| **Mentioned 12+ Project Types** | 49 | | ***52%*** | **<63%** |
| **Mentioned 12-19** | 32 | | ***LO*** | **<HI** |
| **Mentioned 20+ (out of 41) Project Types** | 17 | | ***LO*** | **<HI** |
| **Work in 1-3 Categories** | 37 | | **HI>** | ***LO*** |
| **Only One Category** | 8 | | **HI>** | ***LO*** |
| **Work in 2 Categories** | 12 | | = | = |
| **Work in 3 Categories** | 17 | | **HI>** | ***LO*** |
| **Work in 4 + Categories** | 61 | | ***LO*** | **<HI** |
| **Work in 4 Categories** | 19 | | = | = |
| **Work in 5 Categories** | 23 | | = | = |
| **Work in All 6 Categories** | 19 | | ***LO*** | **<HI** |

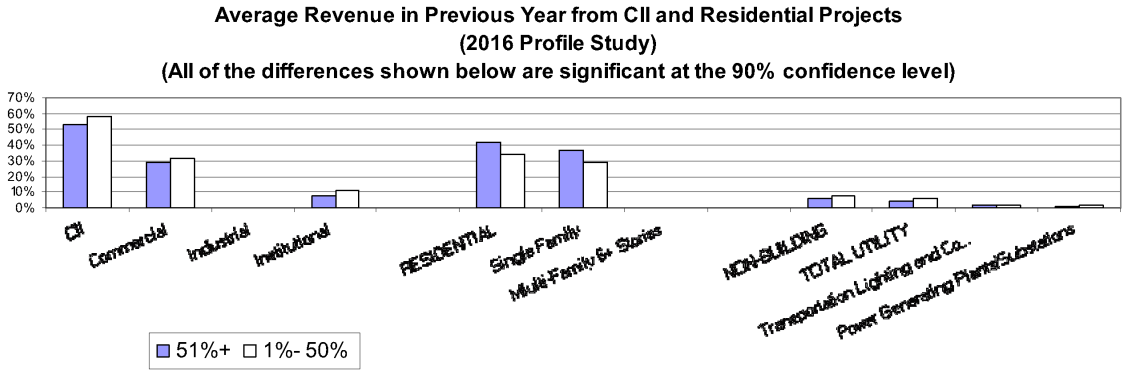
## Sources of Revenue by Building Type and Sector

By Building Type: In 2015, compared with firms that do Design/Build or Design/Assist work, but not as their primary source of revenue, firms that work ***primarily*** on a DB/DA basis are *more* likely to (do ANY) work on Residential projects, particularly Single-Family housing[7]. This difference also emerged in 2013 but was not evident in 2011.

- In contrast, compared with firms that do Design/Build or Design/Assist work, but not as their primary source of revenue, firms that work ***primarily*** on a DB/DA basis are *less* likely to do all aspects of CII work: Commercial, Industrial and Institutional. This was also the case two years and four years ago. In addition, in 2015, firms that work ***primarily*** on a DB/DA basis are *less* likely to do Non-Building work including Utility work such as Transportation Lighting and Communications, Power Generating and Substations, Distributed Generation/Alternative Energy, Line work and/or Smart Grid Technology. [T24]

The **mean** revenue results generally follow the patterns of types of work performed. Firms that work ***primarily*** on a DB/DA basis receive a slightly, but significantly higher average percent of revenue from Residential projects, particularly from Single-Family housing work but lower average revenue from CII, particularly Commercial and Institutional projects. The higher mean revenue from Industrial work, which was observed in 2013 and 2011 was not evident in 2015, where there was no difference.

Firms that work ***primarily*** on a DB/DA basis receive a slightly, but significantly lower average percent of revenue from Non-Building work including Utility, Transportation Lighting and Communications and Power Generating Plants and Substations.




[7] But less likely to work on Multi-Family housing

By Sector: Compared with firms where DB or DA accounts for between 1-50% of revenue, firms working ***primarily*** on a DB or DA basis are ***less*** likely to have done (ANY) work in three of the sectors (New Construction, Modernization/Retrofit and Maintenance Done Under Contract); there is no difference in the case of doing Repair work Maintenance not done under contract.

The 2015 results are consistent with 2013 in terms of lower participation in New Construction and Modernization/Retrofit.

The **mean** revenue results do not closely follow the patterns of types of work performed except in the case of New Construction.

| | **ANY Revenue from DB or DA** | | | **Average Revenue from DB or DA** | |
|---|---|---|---|---|---|
| Table 39 | **Primarily DB or DA (51%+)** | **Between 1%- 50%** | | **Primarily DB or DA (51%+)** | **Between 1%- 50%** |
| | (818) | (922) | | (818) | (922) |
| | | | | | |
| New Construction | | **<** | | | < |
| Modernization/Retrofit | | **<** | | | |
| Repair | | = | | > | |
| Maintenance Done Under Contract | | **<** | | | |
| Maintenance Not Done Under Contract | | = | | > | |

## How Contractors Perform Work
## Specifications

In terms of secifications, there are relatively few differences between firms that work ***primarily*** on a Design/Build or Design/Assist basis and those where design services account for less than 50% of the firm's revenue.

- There is no difference in the percentage of plans and specs that are single brand/proprietary vs. the various types of multiple specs in total or by type of multiple spec: Multiple brand, "Or Equal to", or Performane Specified.
- There is no difference in the high percentage of plans and specs that are incomplete (about 85% receive ANY incomplete plans and specs; average of 48% for firms working primarily on a DB or DA basis, which is statistically equal to firms where DB or DA acounts for less than one half of revenue).
- Equally likely to have a high (39% on average) or medium (35% on average) ability to influence the electrical design with bulding owners/other design team members.
- Within firms that perform ANY DB or DA work, there is no difference between those that work primarily on a DB or DA basis on influence and degree of collaboration with key trades and specialities vs. firsm where DB or DA acounts for 1-50% of revenue.
- Firms that work primairly on a DB/DA basis report a higher perentage of incomplete Single Family plans and specs compared with firms >50% but there is no difference on including CII, Multi-family Residential, Line Work or Power Generating Plants/Substations
- As shown below, firms that work primarily on a DB or DA basis are less likely to both Specify and Install Building Controls and/or HVAC

| **Roles Played by Firm in Integrated Systems** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Specify *and* Install** | | | **Install *Only*** | | | **Don't Work in Category** | |
| **Bold** and > indicates a significant difference at the 90% level of confidence | **Primarily DB or DA** | **DB or DA Accounts for for 1%- 50%** | | **Primarily DB or DA** | **DB or DA Accounts for for 1%- 50%** | | **Primarily DB or DA** | **DB or DA Accounts for for 1%- 50%** |
| | (105) | (116) | | (105) | (116) | | (105) | (116) |
| Version 7 Base (326) | % | % | | % | % | | % | % |
| Lighting (including Controls) | = | = | | = | = | | = | = |
| Fire/Life Safety | = | = | | = | = | | = | = |
| Security | = | = | | = | = | | = | = |
| Communications (VDV, etc.) | = | = | | 24 | <35 | | = | = |
| Building Controls (incl. HVAC) | 20 | **<31** | | = | = | | = | = |
| HVAC not including Controls) | 9 | **<19** | | = | = | | = | = |

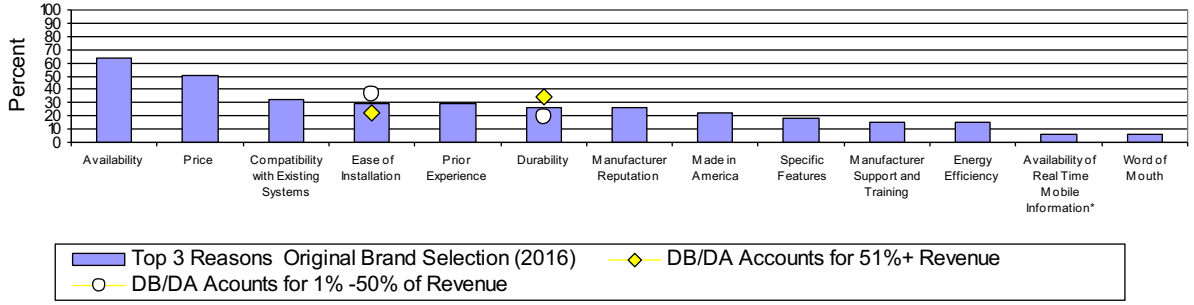
### Main Reasons for Brand Selection – Original and When Making a Substitution

There are a relatively few differences between firms working ***primarily*** on a DB or DA basis and those who perform DB/DA work, but for whom it is not the primarily source of revenue, in terms of any of the reasons for *original* brand selection or brand substitution:

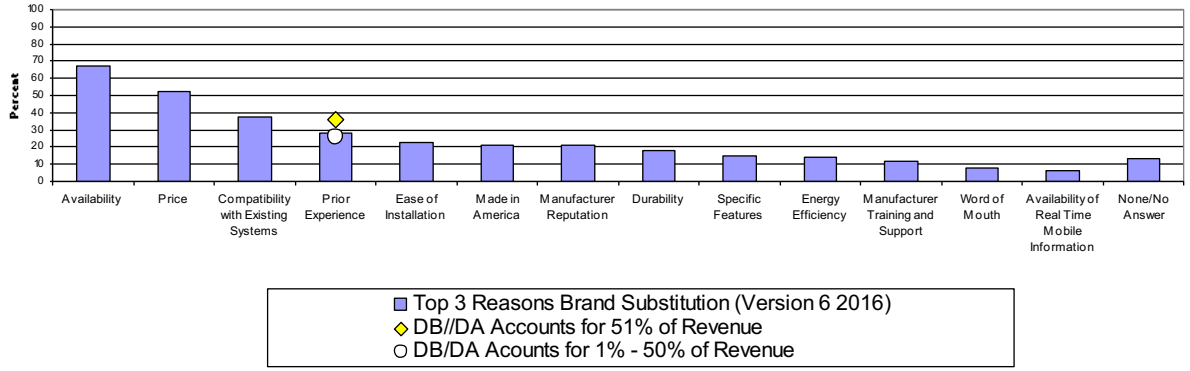
- Original Brand Selection: In 2016, firms that worked ***primarily*** on a DB or DA basis mentioned "Durability" more often compared with those for whom DB-A work is less than half their revenue and "Ease of Installation" less often. There are no other differences on this measure.

- Brand Substitution: In 2016, firms that worked ***primarily*** on a DB or DA basis mentioned "DPrior Experience" more often compared with those for whom DB-A work is less than half their revenue. There are no other differences on this measure.

**Top Three Reasons for Original Brand Selection**
**Version 6 Total (2016)**




**Top 3 Reasons for Brand Substitution**
**Version 6 Total (2016)**



## Training

As shown below, there are no differences between firms that work ***primarily*** on a D/B or D/A basis and those for whom design/build services accounts for between 1% and 50% of their revenue on participation in training, the sources of their training and few differences on the tyes of courses taken.

- There is no difference in their likelihood to have taken or to plan to take training.
- There are only seven differences in types of course work, shown on the following page. In each case, those who work primarily on a DB/DA basis are *less* likely to have taken course work in a given area; they are not higher on any type of course work
    - Three of the seven courses are in the area of Sustainability. The reaminder are: Safety, Power Qualtiy, Lighting Design and Increasing Productivity
- There is no difference between those who work primarily on a DB-A basis and those for whom DB or DA accounts for between 1% and 50% of their revenue on sources of training or certification (not shown).

| Training 2016 Profile Study | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Future Training | | | | Past Training | | |
| | Total | Design/Build Work Accounts for 51%+ | Design/Build Work Accounts for 1% to 50% | | Total | Design/Build Work Accounts for 51%+ | Design/Build Work Accounts for 1% to 50% |
| | (350) | | | | (350) | | |
| Plan to Take Training | 78% | = | = | | Not Asked | Not Asked | Not Asked |
| | | | | | | | |
| Took Training | Not Asked | Not Asked | Not Asked | | 70% | = | = |

Certification

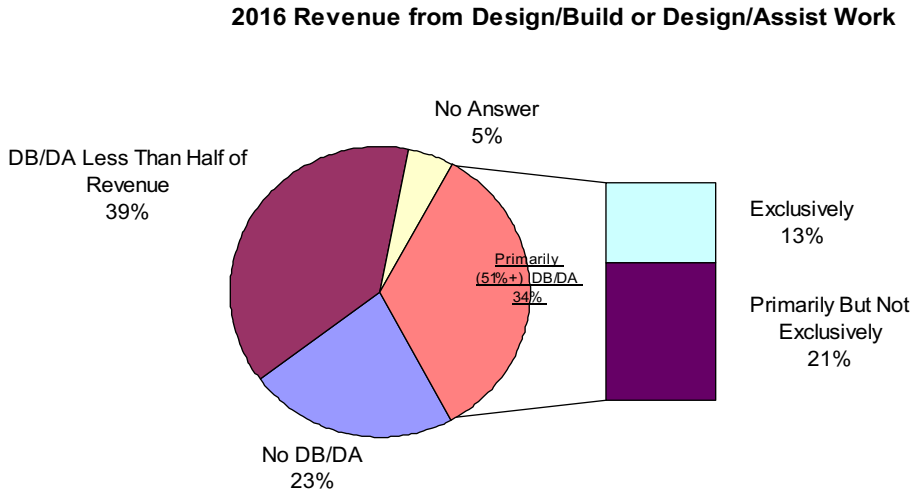
| | Past/Future Training | | |
|---|---|---|---|
| | Total | Design/Build Work Accounts for 51%+ | Design/Build Work Accounts for 1% to 50% |
| Plan to Take or Took Training | (281) | (102) | (116) |
| Organization or Association | 56% | = | = |
| Manufacturer | 39% | = | = |
| Vocational or Other School | 29% | = | = |
| All Other Sources | 13% | = | = |

| Training – Main Focus of Course Work (2016 Profile Study) | | | |
|---|---|---|---|
| | **Total** | **Primarily DB/DA** | **DB/DA is 1%- 50% of Revenue** |
| | | | |
| Will Take/Has Taken Training | | | |
| And Answered Question About Course Work | | | |
| | % | % | % |
| Safety (Electrical/Personal/On-site/Jobsite) | 42 | 39 | **<50** |
| Lighting: Lamp Technology, including LEDs | 39 | 34 | **<46** |
| Sustainability: Alternative Energy Systems | 22 | 18 | **<29** |
| Power Qualtiy | 19 | 16 | **<26** |
| Sustainability: LEED Certification | 12 | 6 | **<18** |
| Sustainablity: Energy Storage | 9 | 6 | **<13** |
| Increasing Productivity | 17 | 12 | **<24** |

**Bold** and > indicates a significant difference at the 90% level of confidence

## WHEN DESIGN/BUILD OR DESIGN/ASSIST IS THE *EXCLUSIVE* SOURCE OF REVENUE

In the 2016 Profile Study, Design/Build or Assist projects are the ***exclusive*** source of revenue for 13% of electrical contractors. This is a statistically increase from two years when it was 10%. In fact, about 10% of electrical contractors have worked exclusively on a DB/DA basis since 2008. The large sample size (2419) in 2014 is affording the opportunity for some further analysis of this sub-group. However, the additional analysis will be limited to "core" questions that were asked of all respondents, rather than those asked in only in a single version.



## Who Works *Exclusively* on a Design/Build or Design/Assist Basis?
### …By Age

Older respondents are more likely to be employed by firms that work ***exclusively*** (100%) on a DB or DA basis or to be employed by firms that do **not** offer Design/Build or Design/Assist services.

| | Firm Offers Design/Build or Design/Assist Work by Age of Respondent | | | | |
|---|---|---|---|---|---|
| Table 1 | **Total** | **Do "ANY" Design/Build Work** | **DB Work Accounts for 100% of Revenue** | **DB Work Accounts for 1-99% of Revenue** | **Do No Design/Build Work** |
| | **(2419)** | **(1740)** | **(301)** | **(1439)** | **(547)** |
| **Age 55+** | 67% | 65% | **71%>** | 64% | **<72%** |
| **Age 65+** | 24% | 21% | **29%>** | 19% | **<30%** |
| **Mean Age** | 57.3 | 56.6 | 58.1> | 55 | **<58.5** |

**Bold** and > indicates a significant difference at the 90% level of confidence
Note: Cells that are empty indicate that there is no difference in that subgroup from the total (overall average)

## …By Respondent Education

In 2016, there was no difference in educational attainment between firms working exclusively on a DB or DA basis compared with firms that offer design services but not exclusively.

In contrast, in 2014, not shown, respondents employed by firms that worked ***exclusively*** on a DB or DA basis are more likely to have attended college compared with firms that derive 99% or less of their revenue from Design/Build or Design/Assist work. Respondent college attendance was lowest in the 2014 Profile Study among firms that do **not** offer DB or DA services.

| | **Firm Offers Design/Build or Design/Assist Work by Age of Respondent** | | | | |
|---|---|---|---|---|---|
| | **Total** | **Do "ANY" Design/Build Work** | **DB Work Accounts for 100% of Revenue** | **DB Work Accounts for 1-99% of Revenue** | **Do No Design/Build Work** |
| | **(2419)** | **(1740)** | **(301)** | **(1439)** | **(547)** |
| | **%** | **%** | **%** | **%** | **%** |
| **HS Only** | 12 | 11 | 14 | 11 | 12 |
| **Apprenticeship or Trade or Vocational School** | 31 | 32 | 32 | 32 | 29 |
| **Any College** | 57 | 57 | 53 | =58 | =59 |

**Bold** and > indicates a significant difference at the 90% level of confidence

## …By Number of Employees

As was the case with respondent age, respondents who work in small firms are more likely to be employed by firms that work ***exclusively*** (100%) on a DB or DA basis or to be employed by firms that do **not** offer Design/Build or Design/Assist services.

| | Firm Offers Design/Build or Design/Assist Work by Age of Respondent | | | | |
|---|---|---|---|---|---|
| | **Total** | **Do "ANY" Design/Build Work** | **DB Work Accounts for 100% of Revenue** | **DB Work Accounts for 1-99% of Revenue** | **Do No Design/Build Work** |
| | **(2419)** | **(1740)** | **(301)** | **(1439)** | **(547)** |
| | **%** | **%** | **%** | **%** | **%** |
| 1-4 | 56 | 49 | **72>** | 44 | **<73** |
| 5-9 | 16 | **18>** | 16 | 18 | 12 |
| 10-19 | 9 | **11>** | 5 | **<12** | 6 |
| 20-99 | 11 | **14>** | 4 | **<16** | 6 |
| 100+ | 7 | **9>** | 3 | **<10** | 4 |
| | | | | | |
| 1-9 | 72 | 67 | **88>** | 62 | **<84** |
| 10+ | 28 | **33>** | 12 | **<37** | 16 |
| 50+ | 11 | **13>** | 4 | **<15** | 5 |

**Bold** and > indicates a significant difference at the 90% level of confidence

## …By Annual Revenue

As noted earlier in the report, 13% of electrical contractors work ***exclusively*** on a Design/Build or Design/Assist basis, an additional 22 % work primarily, but not exclusively (not shown), on a DB/DA basis.

- In 2015, as was the case in 2013, firms with revenues of under $250K are most likely to work ***exclusively*** on a DB/DA basis.
    - In contrast, firms with revenues of **over** $250K are significantly more likely to perform DB or DA work but where this type of work accounts for less than 100% of their revenue.

| **PERFORM DESIGN/BUILD OR DESIGN/ASSIST WORK IN 2015** | | | | | | |
|---|---|---|---|---|---|---|
| | Total | <$250K | Between $250K and $1 Million | Between $1 Million and $2.5 Million | Between $2.5 Million and $10 Million | $10 Million + |
| | (2419) | (1024) | (638) | (252) | (212) | (197) |
| Exclusively D/B or D/A (100% of | (305) | (176) | (69) | (21)** | (12)** | (7)** |
| | 13% | **17%>**vs. $1 million + | *11%* | *8%* | *6%* | *4%* |
| DB or DA Accounts for 1-99% of | (1451) | (442) | (421) | (192) | (172) | (175) |
| | 60% | *43%* | **<66%** | **<76%** | = **81%** | **<89%** |
| ANY | (1756) | (618) | (490) | (213) | (184) | (182) |
| | 73% | *60%* | **<77%** | **<85%** | =**87%** | =**90%** |

Tiny base; shown for context

Q9 **Bold** and > indicates a significant difference at the 90% level of confidence

## Types of Work Performed

Earlier in the report, we noted similarities between firms that work ***exclusively*** on a Design/Build or Design/Assist basis and firms that do **not** provide design/build services. The main similarities are that *older* respondents tend to work for each of these disparate types of firms and that the firm, itself, is likely to be small (1-4 employees).

In this section, we are comparing the types of projects performed by firms that work ***exclusively*** on a DB or DA basis to those that do not offer design services to try to tease out other ways in which these two types of small firms are different.

Compared with firms that do not offer design services, firms that work ***exclusively*** on a DB/DA basis…

- Are significantly more likely to work Power, Lighting Fixtures, LED Lighting (including Lamps, Fixtures and Controls), Energy Management/Power Quality, Data Centers, many aspects of Sustainability including Energy Efficiency Projects (non-LEED projects), Solar Photovoltaics, Energy Audits including Thermal Imaging, Geothermal, Smart or Net Metering, Co-Generation, HVAC (Mechanical) HVAC Controls.
    - These are all areas that can be performed by more technically adept firms, even if they are small in size.

## Types of Work Performed in Previous Year By Percent of DB/DA Revenue (2016 Profile Study)

| | | Revenue from Design/Build or Design/Assist Projects | |
|---|---|---|---|
| | Total | 100% Works Exclusively on DB/DA Basis | 0% Firm Does Not Offer Design/Build or Design/Assist Services |
| | % | (301) | (547) |
| **Lighting Fixtures** | 84 | **81>** | *71* |
| **Wire and Cable** | 84 | 79= | 77 |
| **Power** | 84 | **82>** | *74* |
| **LED Lighting (Including Lamps, Fixtures, and Controls)** | 84 | **81>** | *74* |
| **Ballasts or LED Drivers** | 69 | 62= | 58 |
| **Lamps** | 73 | 66= | 62 |
| **Lighting Controls** | 72 | 65= | 62 |
| **Daylighting/Shading Systems** | 23 | 13= | 11 |
| **Backup Power/UPS** | 49 | 38= | 34 |
| **Trouble Shooting/Maintenance of Low Voltage Systems** | 45 | 35= | 33 |
| **TVSS/Lightning/Surge Suppression** | 34 | 23= | 19 |
| **Energy Management/Power Quality** | 20 | **14>** | *10* |
| **Structured Wiring/Cabling** | 45 | 34= | 33 |
| **Networking (VOIP/Wireless/Broadband, etc.)** | 35 | *28* | **<37** |
| **Fiber Optics (Communications and Security)** | 20 | 9= | 10 |
| **Data Centers** | 17 | **10>** | *4* |
| **Energy Efficiency Projects/Upgrades (non-LEED)** | 37 | **26>** | *20* |
| **LEED Projects** | 19 | 13= | 13 |
| **Solar Photovoltaics** | 16 | **12>** | *7* |
| **Electric Vehicle Charging Stations** | 17 | 10= | 10 |
| **Energy Audits (Including Thermal Imaging)** | 11 | **6>** | *3* |
| **Geothermal** | 7 | **7>** | *3* |
| **Smart or Net Metering** | 10 | **6>** | *3* |
| **Energy Storage** | 5 | 5= | *3* |
| **Co-Generation** | 10 | **8>** | *5* |
| **Wind Generation** | 4 | 3= | 2 |
| **Smart Grid Technology** | 2 | 3= | 2 |
| **Microgrids** | 2 | 1= | 1 |
| **Fuel Cells** | 2 | **3>** | *1* |
| **Pre-Assembly/-Fabrication of Electrical Components** | 19 | 14= | 11 |
| **HVAC (Mechanical)** | 23 | **24>** | *17* |
| **Water Utilities or Waste Water Treatment** | 14 | 9= | 9 |
| **HVAC Controls** | 38 | **33>** | *26* |

**Bold** and > indicates a significant difference at the 90% level of confidence

Note: Cells that are empty indicate that there is no difference in that subgroup from the total (overall average)

**Types of Work Performed in Previous Year By Percent of DB/DA Revenue (2014 Profile Study)**

| | | Revenue from Design/Build or Design/Assist Projects | |
|---|---|---|---|
| | Total | 100% Works Exclusively on DB/DA Basis | 0% Firm Does Not Offer Design/Build or Design/Assist Services |
| | % | (301) | (547) |
| **[CII] Fire/Life Safety (including Alarms/Detectors)** | 33 | 19= | 17 |
| **[CII] Industrial Controls** | 29 | **23>** | *15* |
| **[CII] HVAC Controls** | 27 | **20>** | *15* |
| **[CII] Security/CCTV/Access/Motion, etc** | 26 | 15= | 13 |
| **[CII] Sound and Video** | 16 | 8= | 9 |
| **[CII] Automated Build Systems/ Connectivity** | 16 | 10= | 7 |
| **[CII] Programming and Commissioning** | 15 | 8= | 7 |
| **[RES] Fire/Life Safety (incl Alarms/Detectors)** | 30 | 26= | 22 |
| **[RES] Security/CCTV/Access/Motion, etc** | 16 | 13= | 12 |
| **[RES] Home Automation/Smart Home/Connectivity** | 21 | **20>** | *13* |
| **[RES] HVAC Controls** | 21 | 22= | 18 |
| **[RES] Home Theater/Sound** | 18 | 16= | 14 |
| **[RES] Programming and Commissioning** | 5 | **5>** | *2* |
| **Mentioned 1-9 Types** | 36 | 51= | 55 |
| **Mentioned 12+ Project Types** | 49 | 32= | 28 |
| **Mentioned 12-19** | 32 | 23= | 23 |
| **Mentioned 20+ (out of 41) Project Types** | 17 | **9>** | *5* |
| **Work in 1-3 Categories** | 37 | 52= | 53 |
| **Only One Category** | 8 | 12= | 15 |
| **Work in 2 Categories** | 12 | 16= | 18 |
| **Work in 3 Categories** | 17 | 24= | 20 |
| **Work in 4 + Categories** | 61 | 48= | 42 |
| **Work in 4 Categories** | 19 | 19= | 17 |
| **Work in 5 Categories** | 23 | 19= | 18 |
| **Work in All 6 Categories** | 19 | 10= | 7 |

**Bold** and > indicates a significant difference at the 90% level of confidence
Note: Cells that are empty indicate that there is no difference in that subgroup from the total (overall average)

## Sources of Revenue (ANY Work Performed)

By Building Type: Those who work ***exclusively*** on a Design/Build or Assist appear to be specializing in Residential construction, compared to firms where Design/Build or Assist accounts for between 1% and 99% of firm revenue.

Compared with firms where DB-A accounts for between 1-99% of revenue, firms that work ***exclusively*** on a DB/DA basis:

- Are *less* likely to do any work CII work, Commercial, Institutional and/or Industrial, as well as most aspects of Non-Building and more likely to do Residential work/Single-Family work.

| Table 24 | **Exclusively (100%)** | **1%-99% DB or DA** |
|---|---|---|
| | (301) | (1435) |
| | % | % |
| CII | 84 | **<96** |
| Commercial | 69 | **<89** |
| Institutional | 20 | **<46** |
| Industrial | 34 | **<59** |
| RESIDENTIAL | **83>** | 74 |
| Single Family | **81>** | 69 |
| Multi-Family | 27 | **<33** |
| NON-BUILDING | 18 | **<35** |
| TOTAL UTILITY | 14 | **<27** |

By Sector: Firms that work ***exclusively*** on a DB/DA basis are *less* likely to do any New Construction or Modernization/Retrofit or Maintenance but are equally likely to do Repair work.

| Table 33 | **Exclusively (100%)** | **1%-99% DB or DA** |
|---|---|---|
| | (301) | (1439 ) |
| | | % |
| New Construction | 65 | **<88** |
| Modernization/Retrofit | 70 | **<86** |
| Repair | 72 | =76 |
| Maintenance Done Under Contract | 24 | **<86** |
| Maintenance Not Done Under Contract | 50 | **<64** |