Article Title: Criteria | Governments | U.S. Public Finance: Assessing Construction Risk Data: (EDITOR'S NOTE: —On Jan. 9, 2023, we republished this criteria article to make nonmaterial changes. See the "Revisions And Updates" section for details. This criteria article has been partly superseded by the article titled "Issue Credit Ratings Linked To U.S. Public Finance Obligors' Creditworthiness," published Nov. 20, 2019. Specifically, for issues that are in scope of those criteria that have construction risk present, we will use Appendix 1 of those criteria rather than apply these criteria.) 1. Construction risk is present in virtually all public finance transactions, but it typically introduces credit risk only in those transactions where debt service payment is contingent on project completion and/or acceptance. S&P; Global Ratings addresses construction risk directly in the rating, either through an evaluation of the construction process or, with credit support such as letters of credit during the construction period. The depth of the evaluation of the construction process will vary by project; earthquake analysis is unchanged. For example, the analysis performed on a school building will be less than that performed on an off-campus student housing project. 2. S&P; Global Ratings will adopt a continuum of risk approach to assessing construction risk. If there is strong public support for a project, and the projects are not complex, the construction analysis will typically focus on the following issues: Project essentiality; Experience with similar projects; Contractor's experience with the issuer/obligor; Project schedule and cost structure; Construction contingencies in the project budget; Duration of capitalized interest; Insurance coverage during construction, including whether coverage is sufficient to cover full redemption of bonds in the event of damage or destruction; and Full permitting and site approvals. 3. The level of construction risk the project entails will then be evaluated, and if determined to be minimal, a rating will be assigned, based on the obligor's creditworthiness. Generally, if the level of construction risks exceeds the normal threshold of most municipal projects, further analysis typically will be undertaken, which would generally reflect the criteria used within S&P; Global Ratings' project finance group, and may include the use of an outside construction consultant. 4. Where no municipal entity agrees to pay debt service upon completion, and where the project must be completed in order for debt service to be paid, the project ratings will involve a full analysis of the risks of construction. These risks are typically three-fold: Timely completion; Project performance--whether the project will be built as anticipated or perform as expected; and Project cost. 5. Each layer of risk can affect whether the project will produce the cash flow necessary to pay debt service, generate sufficient demand as built, and whether unanticipated costs will result in inability to pay debt service. These projects generally are likely to include many federal leases, public-private partnerships, affordable multifamily housing and non-recourse projects. 6. S&P; Global Ratings has used this approach for construction risk analysis for many years and has developed levels of construction risk based on comparable projects. If construction risk is determined to be appropriately low, a rating based on the obligor's creditworthiness may, all other things being equal, be assigned. If the level of construction risk is excessive, further analysis generally will be undertaken along the lines of project finance criteria and could include the use of an outside construction consultant. 7. Even where a complex project analysis may not ultimately be appropriate for certain projects, S&P; Global Ratings may retain a construction consultant to advise on particular issues. The scope of the consultancy typically encompasses the following principle areas of inquiry: Review of plans and construction documents; Evaluation of the likelihood that the contractor will perform based on historical performance on similar projects; Hard cost budget and construction schedule evaluation—whether costs allocated for the project seem reasonable, whether there is adequate contingency, and whether the construction time frame is aggressive; Project location, special situations (wetlands, weather); Construction schedule; Whether construction is set in a union/nonunion environment; Names of borrower, architect, general contractor, or construction manager; and Review of drawings or plans for the proposed building. 8. A complex project's rating rests, in part, on the dependability of its design, construction, and operation. Should the project fail to achieve timely completion or perform as designed, it will not be able to make its scheduled payments. S&P; Global Ratings' criteria may require the report of an "independent engineer" as an aid to identifying and summarizing construction and other project risks, and certifying that notwithstanding those risks, the project will nevertheless be able to operate in the manner designed, and to generate sufficient cash flow to enable it to make its scheduled debt service payments. 9. For complex projects, construction risk may be divided into its preconstruction and postconstruction facets. The former consists of:

Engineering and design; Site plans and permits; Construction; and Testing and commissioning. 10. Though a project's design may attempt to limit construction difficulties, its construction program may nevertheless adversely affect the project. Limited contractor and vendor experience with the technology can put a project at risk, as can a weak security and warranty package. A construction management plan that fails to adequately control construction fund disbursement can result in cash leakage. Designs requiring complicated sequencing of construction activities may also present delay and cost risks. Construction relying on commercially proven technology and experienced contractors typically can mitigate much of the construction risk attributed to design. Construction And Vendor Experience 11. For complex projects, in most cases, S&P; Global Ratings reviews the performance record of equipment vendors and general contractors in building comparable predecessor projects. Generally, higher-rated projects tend to feature vendors and contractors having broad experience building comparable projects and demonstrated records of meeting schedules. In addition, the better contractors likely will have demonstrated a pattern of meeting budgets and avoiding liquidated damage payments or other penalties. If project sponsors elect to use a fixed-price, turnkey construction contract, S&P; Global Ratings typically verifies that the owners, developers and others have had favorable experience with the proposed contractor. 12. While S&P; Global Ratings does not identify specific vendors or contractors as appropriate for construction, it generally does examine the experience of contractors and vendors in building comparable facilities, as well as overall performance records. S&P; Global Ratings also considers the ongoing and future business interests of the contractor and key vendors. Experience has shown that business interests of contractors, vendors, and sponsors typically contribute as much influence as legal obligations in ensuring on time and under budget construction projects. Construction Funds Management 13. Managing construction fund disbursements frequently provides a mechanism to maintain leverage over the sponsor developer and contractors and thus helps to minimize construction risk in higher-rated projects. Active management by the lender or lenders or their representatives may also achieve this objective. Loan documents typically give lenders the right to closely monitor construction progress and release funds only for work that the lender's engineering and construction expert has approved as being complete. On projects seeking to raise capital from a broader investor base, either through private placement or public debt issues, management of construction funds becomes more difficult because individual investors have no real capacity to oversee construction draws. For such projects, however, third-party trustees, acting in a fiduciary capacity, will generally manage disbursement of funds to protect debt holders' interest in the project. 14. In general, the higher rated transactions will provide the following controls over construction funds: Retention of all debt-financed funds in a segregated account by a trustee experienced in management of project construction, preferably an experienced bank or other lender for these projects; Control over all disbursements from this account to the project with disbursements made only for work certified as complete by an independent project engineer and/or mortgage servicer retained by the construction trustee solely for approving disbursements and monitoring the completion of construction of the project on time and on budget; and Right to suspend or halt disbursements when the trustee, acting in consultation with the independent project engineer, concludes that construction progress is materially at risk because of outside events, such as reversals or revocations of necessary regulatory approvals, or changes in law or cost outside the levels anticipated by the budget and schedule or failure to perform by contractors; and The authority to approve all change orders. 15. In order for the trustee to fund construction draws out of the construction fund, in most instances, the following should be in place: An application and certification for payment (AIA Document G702) completed and received by trustee certifying that construction is in accordance with the plans for the project. The loan must be in balance—an amount necessary to complete project should be on hand or available - remaining uses must equal sources. There should be no events of default under indenture, mortgage, ground lease or any other operating agreements. The owner and trustee should receive lien waivers from the contractor and major subcontractors prior to funding draws. The trustee should receive title insurance bring-downs (i.e. there should be no mechanic's liens on the project) prior to funding draws. Any credit enhancements relied upon in the initial rating should continue to be in place (e.g. LOC or rated completion guarantee). The construction consultant and/or mortgage servicer, if used, should approve the construction draws. The trustee should withhold an applicable amount of retainage (between 5-10%

as decided in beginning of transaction). The trustee should receive certificate of occupancy and certification as to completion of project and satisfaction of punch list items prior to final release of funds from project fund. Construction Schedule And Budget 16. S&P; Global Ratings' assessment of construction risk typically includes a determination of whether the contractor can achieve the proposed construction schedule and budget without costly delays or quality problems. S&P; Global Ratings expects that the independent engineer will have reviewed detailed budgets and construction schedules and will have opined as to their feasibility. Reports without defensible conclusions about schedules and budgets can raise concerns. Higher-rated projects likely will have contractors and equipment vendors who have consistently provided services on time. Budgets typically should include contingencies to cover unexpected construction events (not merely uncosted items) during construction. 17. In addition, S&P; Global Ratings generally assesses the extent to which engineering and design are complete, with equipment procured when construction begins; investment-grade projects tend to have completed these tasks earlier than noninvestment-grade projects. 18. S&P; Global Ratings analyzes the independent engineer's conclusions on the adequacy of contingencies for schedule and budget, and related assumptions. S&P; Global Ratings also evaluates performance requirements and incentives for project contractors along with the financial and technical capacity of the contractors. Projects that require construction monitoring by an expert third party, such as an independent engineer, enhance construction surveillance with this oversight mechanism. Cash Flow Considerations And Capitalized Interest Calculations 19. For financings that are cash-flow dependent, such as mortgage revenue bonds for multifamily finance, sufficient funds must be available to pay debt service during the construction period. Project capitalization should demonstrate sufficient amounts of capitalized interest to ensure bondholders will be paid in full and on time during construction. These considerations vary according to bond structure and use of credit enhancements, among other things. In situations where bond proceeds are used to fund construction and there is no construction period credit enhancement, S&P; Global Ratings generally will analyze the following: Earnings during the construction period. Like other transactions, in which funds are held in escrow during development, S&P; Global Ratings will stress the effect of investment earnings on coverage levels. S&P; Global Ratings' analysis involves a comparison of construction fund investment earnings and the mortgage note interest rate. If the construction fund investment rate is lower than the mortgage interest rate, then cash flows should assume that all monies should remain in the construction fund account until the latest date they can be drawn under the bond documents (late draw). If the mortgage rate is lower than the construction fund rate, then it should be assumed that all funds are drawn day one and the mortgagor is making mortgage payments. On a case-by-case basis, income may be shown during the construction period, Length of construction period. S&P; Global Ratings will assume a delay in reaching construction completion, as well as lease-up and stabilization. Delays will vary depending on S&P; Global Ratings' analysis of construction risk, including the opinion of an independent construction consultant in some instances. For low risk projects, a six-month delay might be sufficient, whereas for moderate risk projects, one year might be in order. High-risk construction may call for delays of 18 months or longer. Rental income. S&P; Global Ratings will examine case-by-case whether rental income exists during construction. An example of where rental income could be shown would be in low risk construction situations, such as military housing transactions, where units are on line at the outset of the transaction and demand is extremely deep. In any event, S&P; Global Ratings will assume maximum occupancy of 95%. Occupancy assumptions could be lower if the market analysis cannot substantiate 95%. Trending of income and expenses. If rental income is present in a particular transaction, no trending of income and expenses will be taken into account, except on a case-by-case basis. Debt service coverage. Coverage of debt should always be at least 1x for investment grade ratings. S&P; Global Ratings will determine case by case what the coverage level should be depending on analysis of construction risk and the rating on the bonds. 20. Shortfalls in bond cash flows can be covered by equity contributions or other paid-in cash at closing, letters of credit (LOCs), available funds under an HFA parity program and other rated credit enhancements. Covering Construction Risk With Credit Enhancements 21. When construction risk is moderate to high, credit enhancement during the construction and lease-up phase may be needed for investment grade ratings. This is often the practice in single-asset affordable housing transactions. Credit enhancements are typically in the form of a LOC from a bank rated as high as the bonds, or Freddie Mac, Fannie Mae, GNMA, FHA insurance or guarantees. LOCs 22. The LOC should remain in place until the project achieves stabilization at full occupancy at a predetermined debt service coverage ratio for at least one year. Once the project achieves stabilization, the LOC may be released. The rating during the credit enhancement period will be limited by the rating of the credit enhancer. The LOC amount should cover bond principal amount and interest to a specified completion date. The trust indenture should have a mandatory draw on the LOC and a corresponding mandatory redemption of the bonds from LOC proceeds in the event that the project does not reach completion and lease-up at specified debt service coverage by the specified completion date. Please see, "Methodology And Assumptions For Analyzing: Letter Of Credit Supported Debt," published Feb. 20, 2015, for a full description of S&P; Global Ratings' criteria relating to letters of credit. Freddie Mac, Fannie Mae, GNMA guarantees/FHA insurance 23. Please see "U.S. Federally Enhanced Housing Bonds Rating Methodology," published Nov. 12, 2019, for a full description of rating criteria. Construction risk is typically fully mitigated by the insurance and guarantees; however, transaction documents must accurately reflect the mechanics of the program, cash flow considerations and capitalized interest calculations must be incorporated into the analysis, and S&P; Global Ratings assumes a "worst case" receipt of guarantee and insurance proceeds. Turnkey Contracts As Credit Enhancements 24. Sponsors often use "turnkey" ("soup-to-nuts") contracts on major projects as a means of shifting construction risk away from equity and lenders. In a turnkey contract, the builder promises to deliver the project complete on a certain day, and takes all responsibility for design, engineering, procurement, construction, and testing. All the project owner has to do is pay the contract costs, and "get the keys" to a fully functioning project at the end of the process. In appropriate circumstances, turnkey contracts can shift risk to the extent that they may be viewed as an indirect type of credit enhancement by providing for timely and full completion on pain of damage or penalty payments, on which the project might be able to rely for debt service. Nevertheless, prompt payment of liquidated damages is more a desideratum than a reality. 25. Turnkey or other construction contracts cannot eliminate all risk. Some risk generally remains, such as force majeure and change-of-law events, which by definition, cannot be controlled by the vendor and contractor. Revisions And Updates This article was originally published on June 22, 2007. Changes introduced after original publication: Following our periodic review completed on Oct. 20, 2016, we updated the contact list, updated the criteria references in the text, and added the "Related Criteria And Research" section. Following our periodic review completed on Oct. 20, 2017, we updated the contact information and "Related Criteria" list and made minor clarifications in the text. Following our periodic review completed on Oct. 16, 2018, we updated the contact information and the "Related Criteria" list. On Nov. 12, 2020, we republished this criteria article to make nonmaterial changes to update criteria references, including in the "Related Criteria" list. On Jan. 9, 2023, we republished this criteria article to make nonmaterial changes to the contact information. Related Criteria And Research Related Criteria Methodology For Rating U.S. Public Finance Rental Housing Bonds, April 15, 2020 Issue Credit Ratings Linked To U.S. Public Finance Obligors' Creditworthiness, Nov. 20, 2019 U.S. Federally Enhanced Housing Bonds Rating Methodology, Nov. 12, 2019 Methodology And Assumptions For Analyzing Letter Of Credit-Supported Debt, Feb. 20, 2015 Principles Of Credit Ratings, Feb. 16, 2011 Public Finance Criteria: Federal Leases, June 18, 2007