City of Rochester, New Hampshire
PUBLIC WORKS DEPARTMENT
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MEMO PUBLIC WORKS & BUILDING COMMITTEE AGENDA

TO: **PUBLIC WORKS AND BUILDINGS COMMITTEE**

FROM: **PETER C. NOURSE, PE**
DIRECTOR OF CITY SERVICES

DATE: February 9, 2023

SUBJECT: Public Works & Buildings Committee Meeting
Meeting Date ***Thursday February 16,2023 at 7PM***

There will be a Public Works and Buildings Committee Meeting held on Thursday February 16, 2023 at 7PM. This meeting will be at City Hall in City Council Chambers

AGENDA

1. Approval of the January 19, 2023 PWC Minutes
2. Public Input
3. Colonial Pines Phase 4 Sewer Routing Options
4. Cocheco Water Treatment Plant Upgrades
5. Gonic Dams Removal Project Update
6. Winter Operations Policy Update
7. Other

Public Works and Buildings Committee
City Hall Council Chambers
Meeting Minutes
January 19, 2023 7PM

MEMBERS PRESENT

Councilor Donald Hamann, Chairman
Councilor Jim Gray, Vice Chairman
Councilor John Larochelle
Councilor Steve Beaudoin
Councilor Alexander de Geofroy

OTHERS PRESENT

Peter C. Nourse PE, Director of City Service
Lisa Clark, Deputy Director DPW
Dan Camara, Coordinator GIS & Asset Mgmt.
Mark Sullivan, Main Street Org. Board Representative
Ms. Matthews, Realtor
Renee Bourdeau, Geosyntec MS4 Consultant

MINUTES

Councilor Hamann called the Public Works and Building Committee to order at 7PM

1. **Approval of November 17, 2022 Meeting Minutes**
   Councilor Larochelle made a motion to accept the minutes of the November 17, 2022 as presented. Councilor de Geofroy seconded the motion. The motion passed unanimously.
2. **Public Input**
   Main Street – Board Member Mark Sullivan addressed the Committee seeking approval of a Main Street project to improve the area of the 44-48 North Main Street Alleyway. He stated that Main Streets ideas included removable decking, chairs, and tables. He also noted that there would be likely be artwork and painting. Mr. Sullivan asked if this is something the Public Works Committee might approve if they came back with more concrete plans. Councilor de Geofroy indicated approval of the idea and stated he would be interested. Councilor Gray suggested using Community Block Development Grant (CDBG) Funding. Mr. Sullivan stated that this would be funded by the Main Street Program Funds. Ms. Clark stated that the Main Street Design Committee has asked DPW to obtain pricing for a future more permanent project for setting a concrete landing in the area to be funded by Main Street. Mr. Sullivan stated this request would be for simple plan to get it in place for use this summer. Councilor Hamann expressed interest and stated he would look forward to seeing the plan.
   2 Spruce Street – Paving Moratorium waiver request. Mr. Nourse stated that this request came in after this meeting agenda was approved. He noted that the street was paved in 2018 and is nearly at the end of the 5-year paving moratorium. Mr. Nourse stated that Ms. Matthews was here to answer any questions and at this time. He stated she has pulled the necessary permits for water and sewer connections and that this request is

for a new single family home construction. He stated that the DPW will support the request with the stipulation that the contractor will patch the road following all DPW conditions.

Councilor Larochelle made a motion to recommend that the full City Council approve the pavement moratorium waiver for 2 Spruce Street with the conditions set for the pavement patch by the DPW. Councilor Beaudoin seconded the motion. The motion passed unanimously.

Mr. Nourse informed Ms. Matthews that the final approval will take place at the February 7, 2023 Regular Council Meeting and that she will have her contractor work with DPW on the pavement restoration plan.

3. **Municipal Separate Storm Sewer Permit Program Update (MS4)**.

Mr. Nourse stated that this is a periodic update item for the Committee regarding the City's National Pollution Discharge Elimination System (NPDES) MS4 Permit that is issued every five years by the Environmental Protection Agency (EPA). He explained the last permit was issued in 2017. Mr. Nourse stated that this permit regulates storm water from the City's MS4 infrastructure into water bodies that are impaired. The MS4 public infrastructure systems is a system that conveys, and sometimes treats stormwater, into receiving water bodies. Mr. Nourse stated that this includes roads, catch basins, pipes, curbs, gutter, ditches, manmade channels, and storm drains that are owned and operated by a government entity. He explained that certain geographic areas of the City are regulated by the permit. He stated in general, these are areas with impervious cover and MS4 infrastructure. The permit requires the elimination of sewer and other contaminants, prior to entry into the MS4 infrastructure. He stated that our rivers are listed as impaired from bacteria, pathogens and in some cases metals, dissolved oxygen, ph, and the Cocheco is a contributary of the Great Bay which is impaired for nitrogen. Mr. Nourse stated that the City has invested resources and that the City is in a good position of compliance. Mr. Nourse introduce Renee Bourdeau from Geosyntec as the City's consultant for MS4 Permit Compliance. Ms. Bourdeau presented a PowerPoint presentation and discussed the process of permitting, the history of the City's permit, the permit requirements past and present, the status of compliance and requirements of the current permit that will continue into the next permit. This presentation is attached to minutes. Ms. Bourdeau explained the current permit objectives include public education, public involvement, illicit discharge detection and elimination (IDDE), a construction site stormwater control program and good housekeeping and pollution control prevention. She described current and future measures being used for compliance and she discussed need for maintenance of the City's MS4 infrastructure. Ms. Bourdeau noted that there is City infrastructure on private property that requires easements for maintenance and she stated that we are currently in the process of making sure those easements are documented. Ms. Bourdeau stated that the City is in compliance with the current permit and that she expects the next permit to include continued IDDE as that was given a ten year guideline in the 2017 permit, and she expect additional language the will require the City to retrofit City properties to include stormwater treatment practices, and she expects language that will require additional tracking, mapping and accounting for the City Stormwater treatment practices.

4. **Construction Costs Inflation Alert**

Mr. Nourse stated that the agenda packet had included a report from the Associated

General Contractors of America. He explained the report as an alert detailing the effects of the escalating construction cost. This report is attached to the minutes. Mr. Nourse stated the report gives information on the volatility in materials cost, the supply chain bottlenecks and the tight labor market. He explained that this report details the reasons we are currently experiencing construction project delays and price escalations and he noted some advice for future project was also contained.

5. **External Funding Grants / Loans**

Mr. Nourse stated that the DPW has been aggressively seeking grants and State of NH State Revolving Fund loans (SRF). He stated that we do this as it allows us opportunities to improve infrastructure that due to budget constraints would either take us much longer to implement or not be possible using only local funds. He displayed the attached spreadsheet that shows we have approximately fifteen projects in progress with a total value of over seventeen million dollars in grant funding. This amount is over 40% of the total project values. He stated that the SRF loans also provide 10-15% principal forgiveness on the total loan value. He stated that there are about five projects totaling several million dollars, including the Rt11 Projects. He stated that NHDOT has provided us with project managers, and we should be able to start moving these projects forward. Mr. Nourse explained the footnotes and asterisk on the spreadsheet. He acknowledged that supplemental appropriations are a sensitive issue with some folks, but explained they are often necessary due to the grant and loan award schedule of the NHDES SRF and Grant programs. These award schedules are out of sync with the City's process as we get notified late in the calendar year of the award and funding must be in place prior to June.

6. **Winter Operations Policy Update**

Mr. Nourse stated attached to the agenda was a draft update to the Departments Snow Policy. He stated that staff has been working on updating the policy as the previous one was last updated December of 2009. Mr. Nourse stated that policy is compliant with the RSA's regarding Municipal Liability. Mr. Nourse stated the policy has a stated goal to provide timely, efficient and const effective winter maintenance for the benefit of the City's residents and the general motoring public. He stated that the goal remains the same. He stated that the 2009 policy is dated, verbose and lengthy. Mr. Nourse stated that it references specific equipment and personnel that we no longer have or use. He stated it also does not specify the area like private roads we do not maintain and he stated that it also needs to be updated for public facing processes. Mr. Nourse stated that when read by the public it would give the impression that we are employing resources and procedures that we are not Mr. Nourse stated that it is a department goal to update and simplify the document. Mr. Nourse stated the RSA to not require that we have a policy, but explained it is important to have a policy that states the goals and objectives and to demonstrate for liability purposes that we are following our own internal policy. He stated that he had discussed the policy with the City Attorney and that this policy does not require City Council approval but Mr. Nourse wanted to inform the Committee that the Department is working to update and improve the existing policy. Mr. Nourse stated he would welcome input from the Committee and noted the 2009 policy is on the City's website for comparison. Councilor Haman asked if the Director needed comments tonight. Mr. Nourse stated there is not a rush, but does want to get the edits completed. Councilor de Geofroy suggested that it would be easier to review if they had a copy of the 2009 version for comparison. Ms. Clark stated that it is on the City Website on the

Department of Public Works page under Snow Removal & Ice Control. Councilor de Geofroy also noted that in section 17.0 Execution – we may also want to add a line for Labor Shortages as manpower shortages would also impact execution of the policy. The Committee agreed to review the policy and to bring any additional suggestions back to next month's meeting.

7. Innovation Way – Ruts

Mr. Nourse stated that he had been asked to add this issue to the agenda as there had been complaints of roadside ruts due to large semi-trucks and vehicles parking in the grass area. Mr. Nourse stated that he has spoken with staff working in the area and they have noted that it is not just trucks causing the problem, it is also cars from a local business that prohibits smoking at their facility and employees are driving out to this location for breaks. Mr. Nourse suggested either using delineators at road edge, no parking signs or both. Councilor Haman suggested no parking signs. The Committee discussed the issue, and the consensus was to put up No Parking signs to protect the grass

Councilor Hamann made a motion to install no parking signs at the DPW discretion to protect the grass area. The motion was seconded by Councilor Gray. The motion pass unanimously.

8. Eastern Avenue Sewer Pipe

Mr. Nourse explained that as part of the Sewer System Master Plan (SSMP) we have videoed tens of thousands of feet of the sewer system to determine the type of pipe, the condition of the pipe and to determine any concerns with inflow or infiltration. Mr. Nourse stated that we have found significant issues with the sewer mains on Eastern Avenue, Walnut Street and Summer Street. Mr. Nourse displayed pictures from the video of Eastern Avenue. He stated that there is approximately 7600 feet of 18 inch reinforced concrete pipe that runs from Highland Avenue to Allen Street that was installed in 1970. Mr. Nourse stated that concrete is rarely use for sewer pipe and there is severe deterioration in the first 300 feet coming in from Highland Avenue. He stated there is significant infiltration from ground water and manholes are also deteriorated. He explained there are fractures, exposed rebar and the seals are either missing of falling out and he displayed pictures from video that depicted these issues. Mr. Nourse stated that this is a major trunk line of sewer and there are nine pump stations feeding into this line. He discussed a major break at Highland Street that happened a few years ago that caused significant traffic issues and cost during the emergency repair. He also discussed the poor condition of the vitrified clay pipe on Walnut Street and Summer Street. He described this pipe as very brittle and stated that it was commonly used in the 1930's through the 1960's. Mr. Nourse stated that there will be a request in the FY2024 Budget Capital Improvement Plan (CIP) for cured in place linings to repair these areas as the repair is absolutely necessary. He described the cured in place lining as a cost effective repair method that eliminates the excavation of the pipe and will give it an additional life expectancy up to 50 years. He stated that it is also resistant to hydrogen sulfide gas that has led to the significant deterioration in these areas. He described the process used for installation and explained that the installer can install as much as 1000 ft per day. Councilor Beaudoin asked how the flow is handled during the process. Mr. Nourse stated the flow is diverted via pumps and hoses from the area under construction. He stated that

they do this in segments. The Committee discussed the cost effectiveness of the pipe lining vs emergent excavated repairs. Mr. Nourse stated as the SSMP continues there will likely be more areas that are found in need of repair. He stated that 200,000 feet of the system has been smoked looking for inflow and infiltration. Councilor Hamann asked if it was likely that more issues would be found prior to the review of this next budget. Mr. Nourse stated it is possible but that the budget will be used for the projects based on the priority needs of the system. He explained that Eastern Avenue sewer is the priority at this time.

9. Other:

Rapid Reflective Flashing Beacon (RRFB) – Councilor Beaudoin asked if this was going out to bid. Mr. Nourse stated that it would not be. H stated that our contractor for Traffic Signals repairs and maintenance will be providing us with a quote and completing the work. He stated the one we will be installing at Columbus / Upham crosswalk will include downcast lighting that will illuminate each side of crosswalk, but that there will also be a light installed on the telephone pole.

Tree Limb Trimming – Chestnut Hill Road – Councilor de Geofroy stated that he had been in contact with a resident that stated the need for trimming of branches over the roadway on Chestnut Hill Road and Little Falls Bridge Road. He and Mr. Nourse stated they both drove the route and did not see significant issues. Mr. Nourse asked the Councilor for contact information and stated he would call and discuss with resident.

Lighting at Strafford Square and North Main Street – Councilor Hamann asked the Director for information on the lighting in that area. Mr. Nourse stated he would look into it and get back to the Councilor.

Councilor Hamann adjourned the meeting at 8:25 PM.

Minutes respectfully submitted by Lisa J. Clark, DPW Deputy Director Operations & Administration.

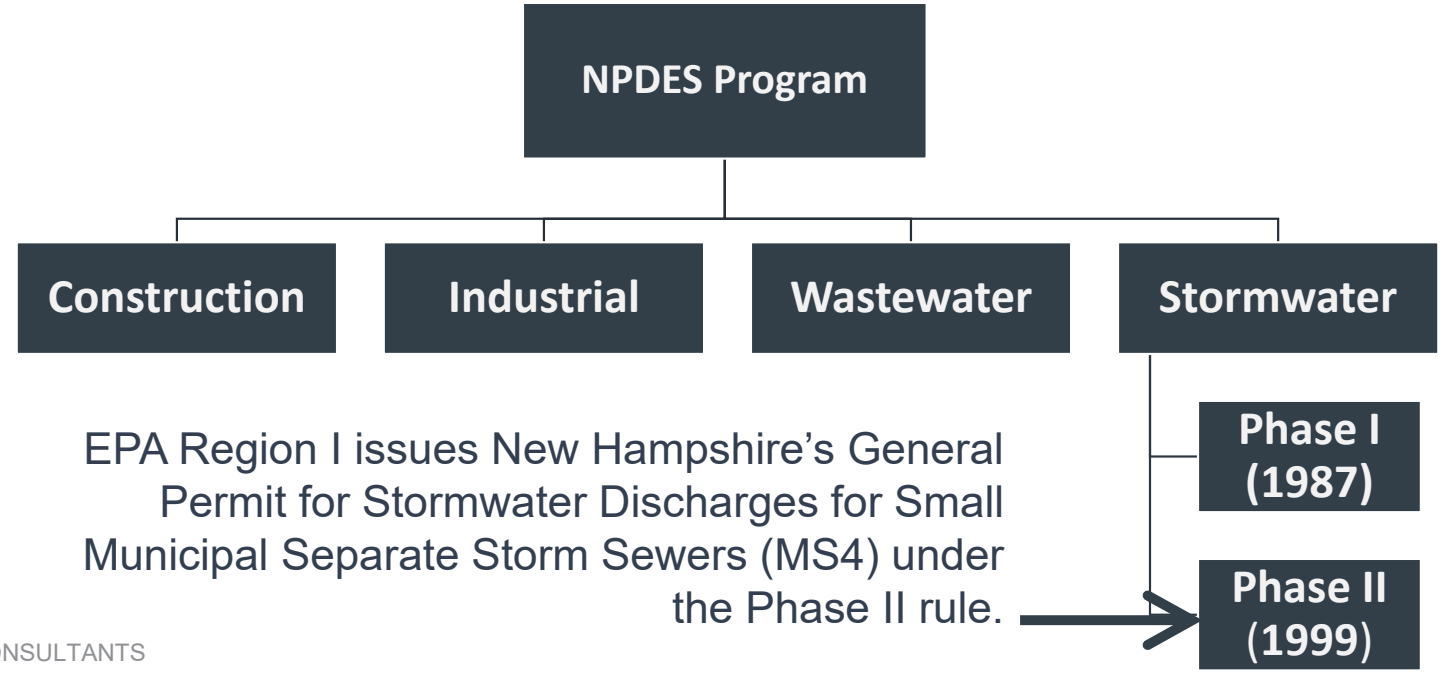
STORMWATER PROGRAM UPDATE

Public Works and Buildings Committee Update

January 19, 2023

NPDES OVERVIEW

Clean Water Act of 1972 established the National Pollutant Discharge Elimination System (NPDES)



EPA Region I issues New Hampshire's General Permit for Stormwater Discharges for Small Municipal Separate Storm Sewers (MS4) under the Phase II rule.

MS4 PERMIT OVERVIEW

2003	2008	2013	2015	2017	2023
General permit for stormwater discharges from small MS4s issued for NH	'03 permit expires; new draft permit issued for NH; existing permit remains effective	2nd draft permit issued based on comments received from 1st draft permit	Re-notice of 2013 draft permit documents issued	Final Permit issued based on comments from 2013 & 2015 draft permits. Effective July 1, 2018	'17 permit expires; new draft permit expected Q1 2023

- 2017 MS4 Permit
  - Applicable to 60 Traditional MS4s and 3 Non-traditional MS4s
  - Additional requirements compared to 2003 permit
  - 5 Year Permit Period (Expires June 30, 2023)
- DPW Overall Objectives
  - Develop and Implement new MS4 Permit Requirements

MINIMUM CONTROL MEASURES (MCMS)

Stormwater Management Program (SWMP)

MCM#1: Public Education

MCM#2: Public Involvement

MCM#3: Illicit Discharge Detection and Elimination

MCM#4: Construction Site Stormwater Runoff Control Program

MCM#5: Post Construction Site Stormwater Control Program

MCM#6: Good Housekeeping and Pollution Prevention

TMDL/WATER QUALITY LIMITED REQUIREMENTS

Supplemental Permit Requirements: Implement targeted Best Management Practices (BMPs) to reduce identified pollutants causing impairment in high-priority water bodies

City of Rochester Action Items
Bacteria/Pathogens Impairment • Increased Ranking for Outfalls in IDDE Program • Additional Public Education and Outreach Requirements
Nitrogen Impairment • Additional Public Education and Outreach Requirements • Additional Good Housekeeping & Pollution Prevention Measures • Nitrogen Reduction Tracking • Additional Stormwater Management Requirements
Metals Impairments • Additional Good Housekeeping & Pollution Prevention Measures • Additional Stormwater Management Requirements

COMPLIANCE SCHEDULE

Completed Year 4 Activities

- Assess Street Design and Parking Lot Guidelines
- Assess Local Regs. for Green Infrastructure
- Identify Permittee-Owned Properties for BMP Sites
- Stormwater Best Management Practice (BMP) Inspections
- Annual Reporting of Compliance

Ongoing and Planned Year 5 Activities

- Catchment Investigation for IDDE Program
- Wet Weather Sampling for IDDE Program
- Update System Maps
- Stormwater BMP Easements
- Annual Reporting of Compliance

Future Activities

- Implement all programs as outlined in SWMP
- Catchment Investigation & Wet Weather Sampling for IDDE Program
- Update System Maps
- Stormwater BMP O&M
- Annual Reporting of Compliance

BENEFITS TO ROCHESTER

- Ongoing satisfactory compliance with 2017 MS4 requirements
- Improved water quality in receiving waters
- Expanded public education on stormwater management
- Improved tracking and inspection of stormwater assets
- Reduction of illicit discharges to City's storm drain system
- Prioritization for structural stormwater BMP retrofits of City-owned properties

MS4 APPLICABILITY

MS4 Permit applies to all City-owned property and assets within the regulated area, which includes those maintained by the School Department.

- Area of City-Owned Property (including school): 2,626 acres
- Area of City-Owned Property within MS4 regulated area (including school): 1,365 acres
- Area of School Maintained Property within City: 149 acres
- Area of School Maintained Property within MS4 regulated area: 149 acres
- Number of City Owned Facilities/Parcels (including school owned): 165 parcels
- Number of School Maintained Facilities/Parcels: 9 parcels

Have conducted outreach with the School Department and Maintenance Staff to educate them on the permit requirements

Geosyntec consultants

RECENT PROGRESS

CITY STORMWATER ASSETS

- 5,000 catch basins
- 860 drain manholes
- 165 outfalls
- 35 Culverts
- 800,000 linear feet of drainpipes and culverts (6" - 84“ diameter)
- 78 City-owned and maintained stormwater treatment practices

STORMWATER TREATMENT PRACTICE INSPECTION

- Inspected 78 practices in Fall 2021
  - Identify/confirm treatment practice type
  - Identify maintenance needs
- Level of Effort to Revive Practice
  - High ($$$): 11 practices
  - Medium ($$): 19 practices
  - Low ($): 24 practices
  - Annual O&M: 23 practices

SEDIMENT BUILD-UP CREATING LIMITED CAPACITY

WOODY VEGETATION LIMITING CAPACITY OF POND

SEDIMENT BUILD-UP CREATING LIMITED CAPACITY

EROSION ALONG A BASIN SIDE SLOPE

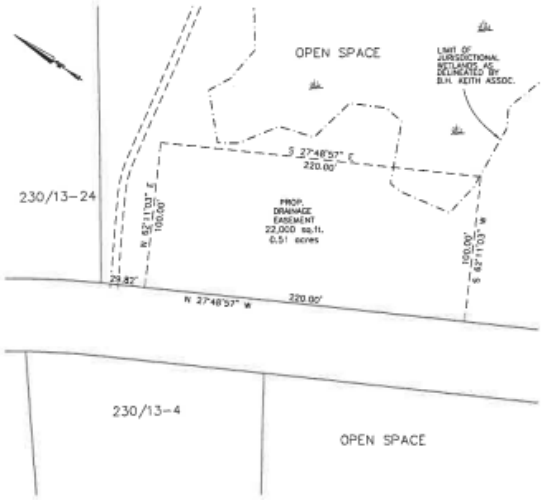
WOODY VEGETATION, LEAVES, AND BRUSH LIMITING CAPACITY OF POND

WHY IS MAINTENANCE IMPORTANT?

- Reduces flooding
- Improves water quality
- Allows the City to get nitrogen load reduction for Great Bay Total Nitrogen General Permit Adaptive Management Plan & Settlement Agreement

STORMWATER EASEMENTS

- Does the City have easements in place to maintain stormwater treatment practices?
- Easement locations were not recorded in GIS
- Conducted a records review (paper and electronic)
  - 64 treatment practices have easements
  - 14 still need research/verification
- Next step: Record easement in GIS



LOCATION: NORWAY PLAINS

CATCHMENT INVESTIGATION

- Investigate each outfall to look for evidence of illicit discharge or connections
  - Any discharge to the storm drain that is not comprised of 100% stormwater
- Starting at the outfall look for dry weather flow or evidence of an illicit connection (odor, turbidity, floatables)
  - If flow is observed sampling is conducted
  - Make observations through entire outfall catchment area
- Collecting asset data (inverts, diameters, pipe type)

CATCHMENT INVESTIGATION

165 Outfalls need to be investigated

- 11 Complete
- 38 are on-going
  - 6 have signs of illicit connection/discharge – need additional investigation
  - 36 need wet weather sample before they can be considered complete
- All outfalls need to be investigated by June 30, 2028

WET WEATHER SAMPLING

- 1 sample required at all 165 outfalls
- Required before a catchment investigation can be complete
- 54 Completed
- All sampling need to be completed by June 30, 2028

NEXT MS4 PERMIT

- Draft anticipated in Q1 2023
- IDDE program would remain the same (10-year program)
- Additional water quality impairment requirements (Appendix H)
  - Retrofit of City properties to include stormwater treatment practices
  - Tracking and accounting requirements for City stormwater treatment practices

GEOSYNTEC CONSULTANTS

QUESTIONS

AGC
THE CONSTRUCTION ASSOCIATION

DEC

2022

CONSTRUCTION INFLATION ALERT

For nearly three years the U.S. construction industry has been buffeted by unprecedented volatility in materials costs, supply-chain bottlenecks, and a tight labor market. To help project owners, government officials, and the public understand how these conditions are affecting contractors and their workers, the Associated General Contractors of America (AGC) has posted frequent updates of the Construction Inflation Alert.

New challenges keep emerging, even as some conditions improve. Overall inflation rates and economic growth have cooled, while congestion at West Coast ports has eased. These changes have led some owners to assume that construction costs and completion times must also have improved. Unfortunately, this is not the case for a large number of projects, materials, and contractors.

Demand for infrastructure, manufacturing, and power construction appears to be strong and likely to strengthen further, perhaps for several years to come. In any case, the cost of construction materials and labor does not generally move in sync with the overall economy. In short, owners should not assume that delaying projects will enable them to avoid volatility and disruptions in construction costs, delivery times, and labor supply, even if the economy slows significantly.

Meanwhile, Russia's ongoing attack on Ukraine and Western sanctions against Russia have disrupted production and transport of dozens of commodities. China's prolonged lockdown of Shanghai and other areas in an attempt to control the spread of covid has also affected production and shipping. New variants of covid, as well as a growing number of people with lingering or recurrent symptoms ("long-haul covid"), add to uncertainty about labor supply.
This version of the Alert is the eighth update since the first edition was posted in March 2021—an indication that the situation remains far from "normal." This document will continue to be revised to keep it timely as conditions affecting demand for construction, labor supply, and materials costs and availability change. Each new version is posted here: https://www.agc.org/learn/construction-data/agc-construction-inflation-alert.

Readers are invited to send comments and feedback, along with "Dear Valued Customer" letters or other information about materials costs and supply-chain issues, to AGC of America's chief economist, Ken Simonson, ken.simonson@agc.org.

Recent changes in input costs

Earlier editions of this guide highlighted the extreme runup in materials costs that began in early 2020. More recently, prices have moved in divergent directions for different materials. But, on balance, they continue to climb at a much higher rate than the consumer price index (CPI), the most commonly cited measure of inflation.

The extent of these increases is documented by the Bureau of Labor Statistics (BLS). BLS posts producer price indexes (PPIs) around the middle of each month for thousands of products and services (at www.bls.gov/ppi). Most PPIs are based on the prices that sellers say they charged for a specific item on the 11th day of the preceding month. Producers include manufacturers and fabricators, intermediaries such as steel service centers and distributors, and providers of services ranging from design to trucking.

The index declined at the beginning of the pandemic but began climbing on a year-over-year basis in August 2020. As prices rose at unprecedented rates for a wide range of construction inputs, the index accelerated steeply, rising at a record-high annual rate of 24% in June 2021. Year-over-year increases remained at or above 20% from May 2021 through April 2022.

Since the spring of 2022, prices have tumbled for lumber and most metals products, and the PPI for nonresidential construction inputs moderated to an 11.2% rate of increase from October 2021 to October 2022. But that is still far higher than the 7.7% annual rate of increase in the CPI over the same interval. In fact, as Figure 1 shows, the yearly increase in the PPI for nonresidential construction inputs has exceeded consumer price inflation every month since August 2020.

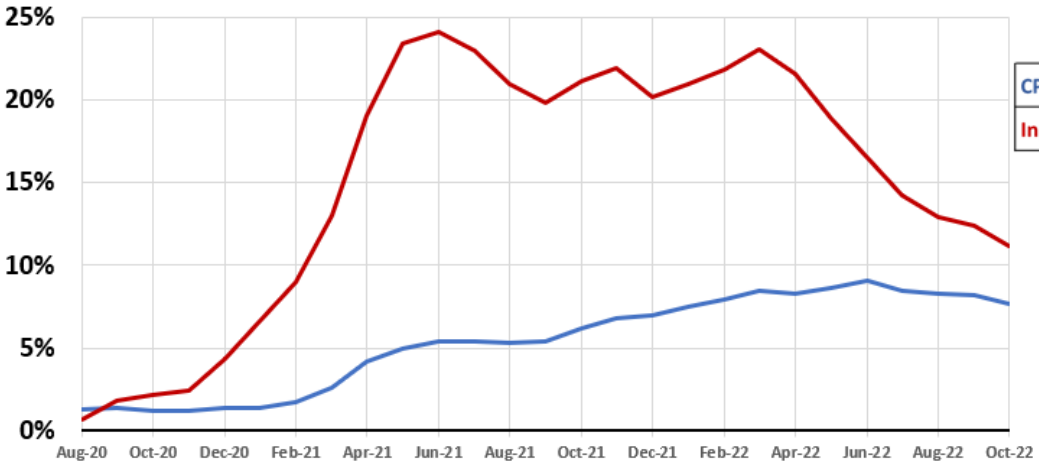
11.2%

The PPI for nonresidential construction inputs rose 11.2% in 12 months

Figure 1

Costs for new nonresidential construction vs. consumer prices

Year-over-year change in PPI for construction inputs and CPI
August 2020 - October 2022, not seasonally adjusted



	12 months to:	
	Aug-20	Oct-22
CPI	1.3%	7.7%
Inputs PPI	0.7%	11.2%

Source: Bureau of Labor Statistics, consumer price index, www.bls.gov/cpi; producer price index, www.bls.gov/ppi

The actual increase in costs varies a lot by type of material. Figure 2 shows the change in PPIs for four material inputs and four types of subcontractors in October 2022 from one month earlier (September 2022) and one year earlier (October 2021). The monthly change in materials costs ranged from a decrease of 0.7% for asphalt paving mixtures and blocks to 9.8% for #2 diesel fuel, while year-over-year changes varied from 14.1% for concrete products to 61.5% for diesel fuel. (Contractors use diesel fuel for their own trucks and offroad equipment. The price of fuel is also reflected in the cost of the thousands of truckloads needed to deliver equipment and materials to jobsites and haul away dirt, debris, and equipment. In addition, many materials require large quantities of diesel fuel or other petroleum-based energy to mine, mix, or manufacture.)

Subcontractors' prices reflect their own materials costs, labor costs, and the degree of tightness in the market for their services. Notably, the PPI for all four types of subcontractors rose far more than the 7.7% increase in the CPI from October 2021 to October 2022: 21.5% for roofing contractors, 18.8% for electrical contractors, 15.7% for plumbing contractors, and 10.9% for concrete contractors.

Prices for many inputs have been extremely volatile, making it difficult for contractors to predict even near-term prices reliably. For instance, the PPI for diesel fuel, which jumped 9.8% from September to October, had declined 12.8% just two months earlier. Conversely, the PPI for steel mill products fell 6.6% from September to October but increased 10.5% from April to May.

Several factors are likely to keep some costs high in 2023, with the possibility of further price spikes. Russia's cutoff of natural gas to central and western Europe has led to a surge in natural-gas prices as the United States exports more liquefied gas to Europe. That affects the cost of construction plastics, glass, and other products that use natural gas as a feedstock or fuel source. Similarly, European demand for diesel fuel, sanctions against Russian oil, and attempts by the "OPEC+" group of oil producers to limit supplies have kept diesel and asphalt prices elevated and subject to large swings.

61.5%

The PPI for diesel fuel increased 61.5% from October 2021

Figure 2

Wide variation in construction input cost trends

Change in producer price indexes (not seasonally adjusted)

	Oct 2022 change from:	
	Sep 2022	Oct 2021
#2 diesel fuel	9.8%	61.5%
Architectural coatings (paint, etc.)	1.1%	27.5%
Asphalt paving mixtures and blocks	-0.7%	20.7%
Concrete products	0.1%	14.1%
Subcontractor price indexes, nonresidential building work		
Roofing contractors	1.9%	21.5%
Electrical contractors	2.1%	18.8%
Plumbing contractors	3.7%	15.7%
Concrete contractors	1.1%	10.9%

Source: BLS, producer price indexes, www.bls.gov/ppi

Given such volatility, owners should not expect contractors' bid prices to mirror a short-term decline in prices for certain inputs or in the overall index for nonresidential inputs, let alone changes in the CPI. The CPI measures the cost of a "basket" of consumer goods and services, which has very little relation to the items driving construction costs.

Input costs and bid prices

Some owners may be under the misimpression that contractors' bid prices are closely linked to changes in input costs. In fact, the two often diverge, as has occurred over the past three years.

The pandemic drastically disrupted production and distribution of many construction materials and caused sharp changes in demand for numerous goods and structure types. Unanticipated price spikes occurred for many inputs—to record levels for lumber, steel, and copper products.

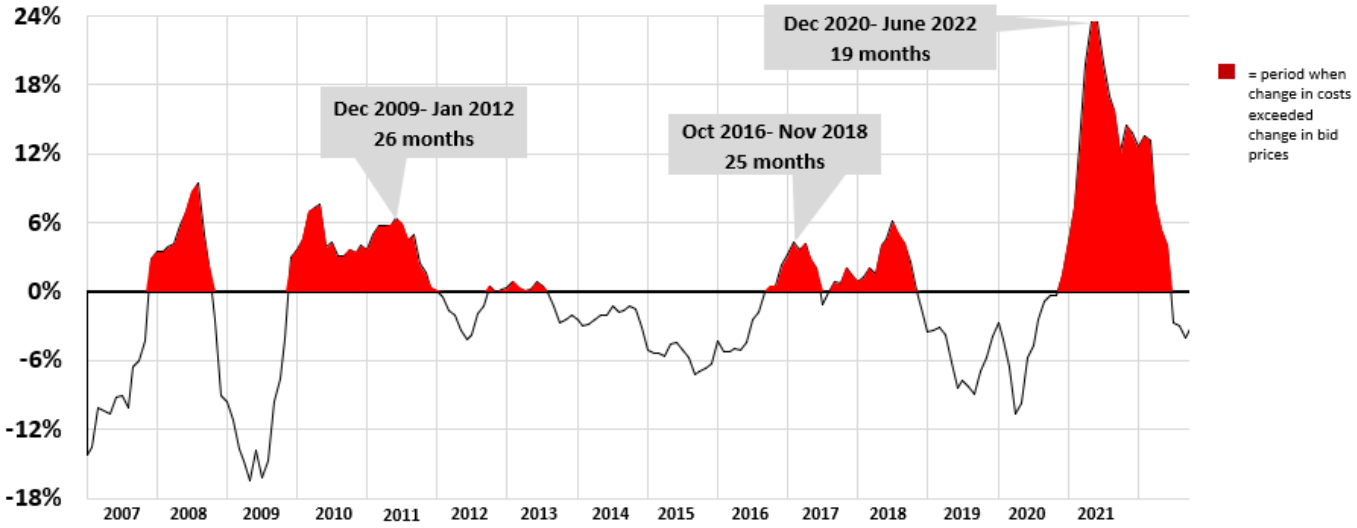
Contractors did not immediately pass along these increases in bid prices. Demand for some project types and in some regions remained weak; as a result, firms refrained from passing through a portion of costs in order to win contracts. In other cases, contractors may have assumed prices would fall by the time they had to purchase the materials.
As demand for construction heated up in 2021 and inflation became established throughout much of the economy, contractors did raise prices to a greater extent. But bid price increases did not "catch up" with increases in input costs until the summer of 2022.

Figure 3 shows the difference in the year-over-year change in input prices (specifically, the PPI for goods inputs to nonresidential construction) minus the change in bid prices (in this case, for new school construction building construction; other comparisons are similar). Periods in red show months when cost increases exceeded bid price increases, while periods below the 0% line show the reverse.

Figure 3

Cost squeeze on contractors can last two years or more

Difference between year-over-year change in materials costs vs. bid prices, Jan 2007-Oct 2022



Source: Source: Bureau of Labor Statistics, www.bls.gov/ppi, producer price indexes for goods inputs to nonresidential construction (material costs) and new school building construction (bid prices)

Over the 16-year history of the series, the number of months and total areas of the two differentials are similar. This is to be expected: If contractors consistently experienced cost increases that exceeded the increases in their bids, they would go out of business. Conversely, if bid-price increases consistently outran costs, other firms would enter the business, driving down profitability.

From December 2020 to June 2022, a period of 19 months, the year-over-year change in materials costs exceeded the year-over-year change in bid prices. Although there were two such intervals that lasted even longer, the gap was three times as great (in the summer of 2021) as in previous episodes, meaning the profit squeeze was much more intense.

As Figure 3 shows, the duration and amplitude of these differences vary greatly and unpredictably. The implication for owners in the current environment is they should not assume a moderation in materials cost increases will be associated with an immediate or proportionate change in bid prices.

Supply chain issues

From the first days of the pandemic, availability and delivery times for materials have been never-ending headaches for construction firms. Recently, shortages and extended lead times have moderated or disappeared for some items but have worsened for others.

On the positive side, port congestion on the West Coast has lessened. Waiting times for lumber and steel products have returned to pre-pandemic levels. There have not been any recent events with supply impacts as severe as the February 2021 freeze in Texas that decimated the production of resins for construction plastics.

Not all bottlenecks have cleared up, however. Contractors continue to be affected by the much-publicized shortage of computer chips. Not only is the construction industry a major buyer of pickup trucks that are in short supply, but deliveries of construction equipment also have been held up by a lack of semiconductors.

Lead times remain unusually long for electrical transformers. In fact, some utilities are reportedly refusing to hook up new construction because they are saving their remaining supply for emergencies. The sole U.S. producer of electrical steel used in transformers has been unable to keep up with demand.

Perhaps the most consequential and long-lasting supply chain issue involves cement and concrete products. Shortages of cement had spread from a few states early in 2021 to 43 states by October, according to the Portland Cement Association. No cement capacity has been added in the United States since 2009. At the same time, the supply of two other “cementitious materials” that are added to some concrete mixes—fly ash and slag—has diminished with the shutdown of coal-fired power plants that supplied those materials as a byproduct of burning coal. (Those closures have also reduced the supply of artificial gypsum for making wallboard.) Exceptionally low water levels in the Mississippi River have limited barge movements of cement in the middle of the country.

43 states

Cement shortage appeared in 43 states by October 2022

Meanwhile, demand for ready-mixed and precast concrete has increased. As a result, many suppliers have placed contractors on allocation, meaning they receive a percentage of previous years’ orders (or possibly none if they are new customers). When contractors can’t pour as much concrete as needed at one time, project completions are delayed, with attendant cost increases. The Portland Cement Association has indicated that additional cement production capacity will come online in the spring of 2023. Some states may receive more cement from Mexico. But availability is likely to remain tight in many areas, particularly as demand increases once projects funded by the Infrastructure Investment and Jobs Act of 2021 and other recent laws and bond issues get underway.

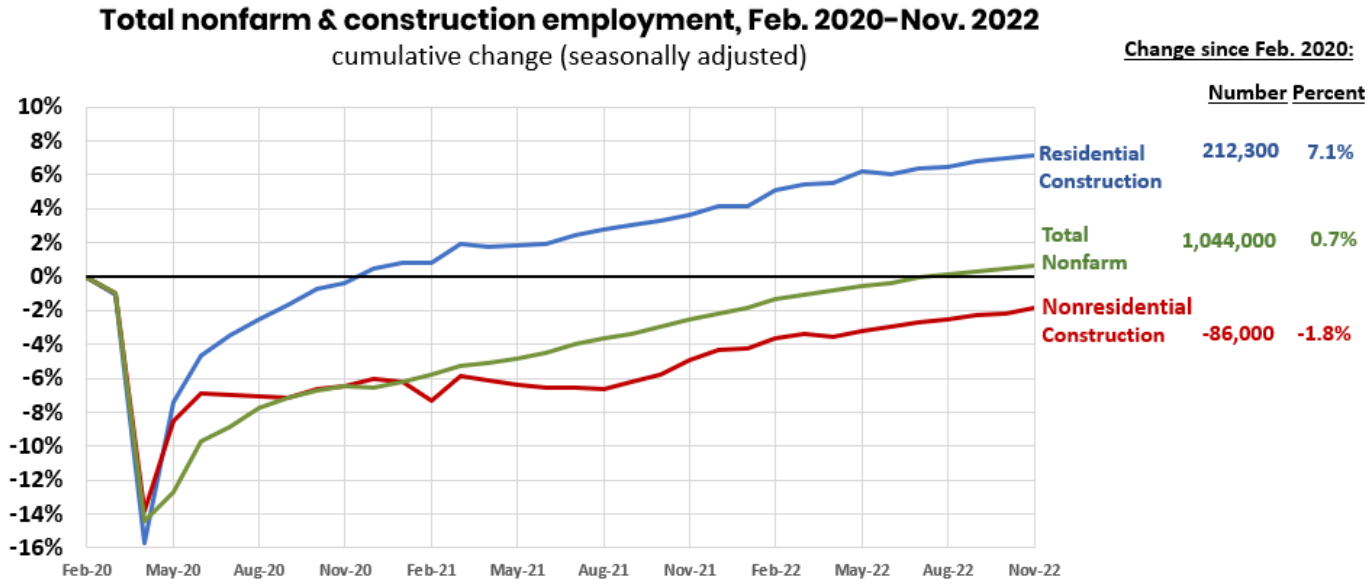
Furthermore, the last three years have shown that the supply chain for many items remains fragile and can easily be disrupted by governmental interventions such as covid-induced shutdowns in China, natural disasters such as hurricanes and freezes, or "one-off" events such as strikes or lockouts of rail or port workers.

Labor supply and costs

Construction employment has bounced back well from the early months of the pandemic. However, construction firms are far short of the number of workers they have been seeking. They have partially closed the gap by getting more overtime from the workers they have, but this cannot continue indefinitely.

As shown in Figure 4, construction industry employment declined by 15% from February to April 2020—a loss of 1.1 million employees in just two months. While both residential and nonresidential construction employment rebounded somewhat in May 2020, for more than a year after that date employment stalled among nonresidential firms—nonresidential building and specialty trade contractors plus civil and heavy engineering construction firms. During that period, thousands of experienced workers moved into residential construction (homebuilding and remodeling), found jobs in other sectors, or left the workforce completely.

Figure 4

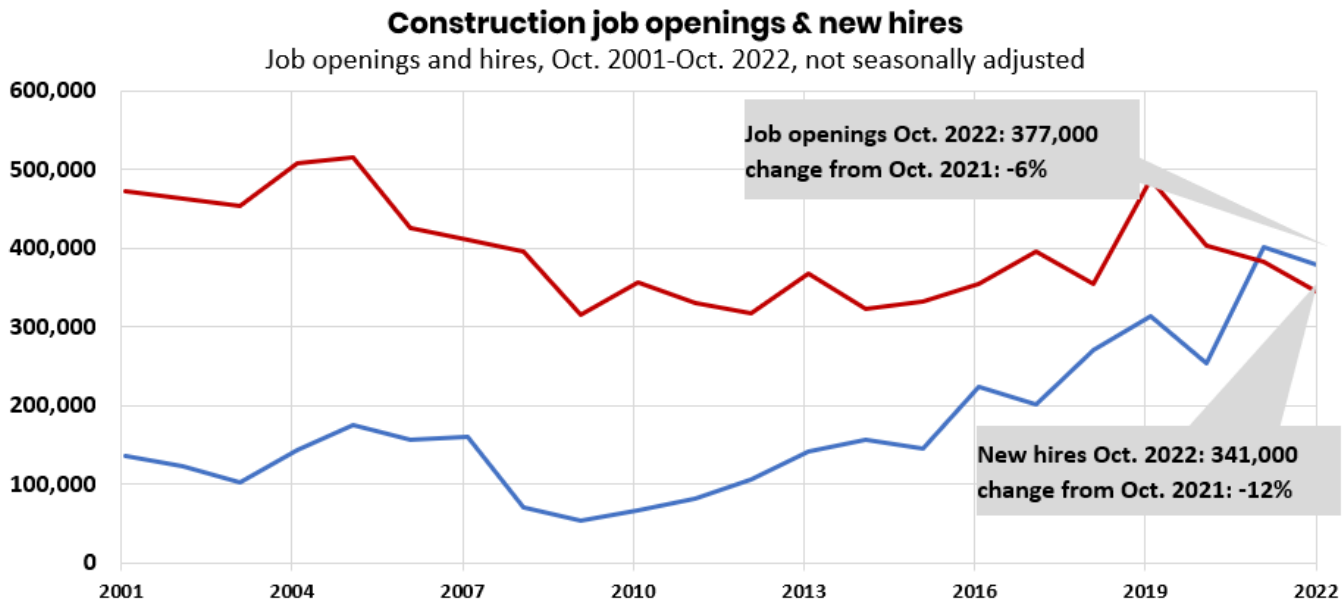


Source: BLS current employment statistics, https://www.bls.gov/ces/

By November 2022, seasonally adjusted construction employment totaled 7,750,000, or 126,000 more than in February 2020. But there was a large shift between residential and nonresidential subsectors. Compared to February 2020 levels, residential construction firms had added more than 210,000 workers, while employment in nonresidential construction was still down 86,000 employees or 1.8%, as shown in Figure 4.

There is strong evidence that the construction industry would have added many more workers if they had been available. As shown in Figure 5, job openings in construction at the end of October totaled 377,000 (not seasonally adjusted), exceeding the 341,000 workers hired during the month. This gap never occurred before 2021 but has occurred in most months of 2022, implying that construction firms are having increasing difficulty filling positions and would have hired twice as many workers each month as they were able to, if there had been enough qualified applicants.

Figure 5

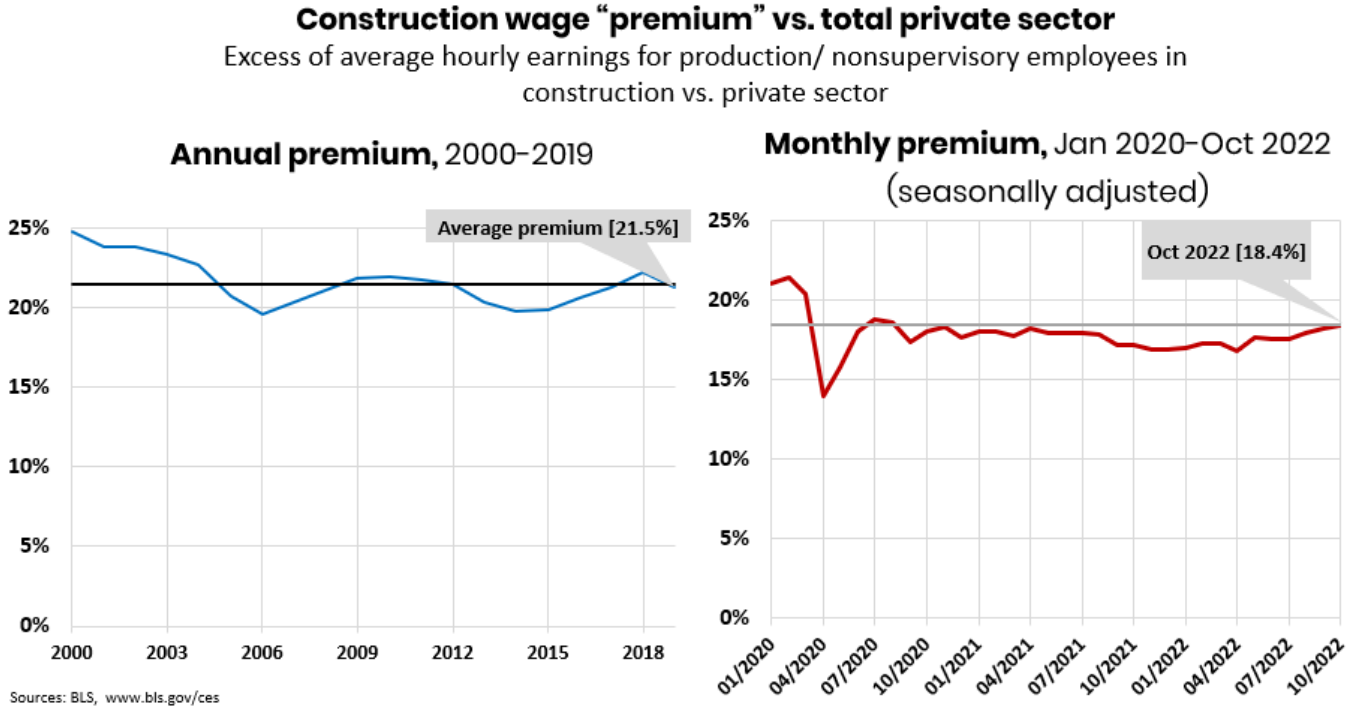


Source: Source: Bureau of Labor Statistics, www.bls.gov/jlt, JOLTS

In order to attract, retain, and bring back workers, construction firms are raising pay. Average hourly earnings in construction for "production and nonsupervisory employees"—mainly hourly craft workers—rose 6.1% from November 2021 to November 2022. That was roughly three times as large as the 2.0% increase that occurred three years earlier, in the 12 months ending in November 2019.

Despite the acceleration in wages, until recently construction pay has not risen as fast since the beginning of the pandemic as in other industries. Historically, as shown in Figure 6, contractors paid a "premium" to attract workers willing to work in the conditions, locations, and hours required for construction. Specifically, average hourly earnings for production workers in construction were 20-23% higher than for than the average for all private sector employees, until the onset of the pandemic. This premium shrank to 15% at the start of the pandemic as restaurants, warehouses, delivery services, and other industries drastically increased pay, and the premium has remained around 17% or less for the past 2-1/2 years. Other industries now offer greater flexibility regarding hours and worksites, including work from home, working conditions that are not possible for construction.

Figure 6



These differences imply that construction wages will have to rise even more steeply to restore (and perhaps expand) the pay premium. In addition, it is likely that contractors will pay more overtime to make up for the workers they don't have. They may also turn more to offsite production and onsite drones, robotics, 3-D printers, and other ways of reducing the number or skill level of the workers they employ.

What can contractors and ownersdo?

Contractors can provide project owners with timely and credible third-party information about changes in relevant material costs and supply-chain snarls that may impact the cost and completion time for a project that is underway or for which a bid has already been submitted.

Owners can authorize appropriate adjustments to design, completion date, and payments to accommodate or work around these impediments. Nobody welcomes a higher bill, but the alternative of having a contractor go out of business because of impossible costs or timing is likely to be worse for many owners.

For projects that have not been awarded or started, owners should start with realistic expectations about current costs and the likelihood of increases. They should provide potential bidders with accurate and complete design information to enable bidders to prepare bids that minimize the likelihood of unpleasant surprises for either party.

Owners and bidders may want to consider price-adjustment clauses that would protect both parties from unanticipated swings in materials prices. Such contract terms can enable the contractor to include a smaller contingency in its bid, while providing the owner an opportunity to share in any savings from downward price movements (as has occurred at various times in recent months with lumber, diesel fuel, and metals prices). The ConsensusDocs set of contract documents (www.consensusdocs.org) is one source of industry-standard model language for such terms. The ConsensusDocs website includes a price escalation resource center (https://www.consensusdocs.org/price-escalation-clause/).

The parties may also want to discuss the best timing for ordering materials and components. Buying items earlier than usual can provide protection against cost increases. But purchase before use entails paying sooner for the items; potentially paying for storage, security against theft and damage, and insurance; and the possibility of design changes that make early purchase unwise.

Conclusion

The construction industry continues to be in the midst of a period of exceptionally volatile and sometimes fast-rising costs for a variety of materials, compounded by major supply-chain disruptions and difficulty finding enough workers—a combination that threatens the financial health of many contractors. No single solution will resolve the situation, but there are steps that government officials, owners, and contractors can take to lessen the pain.

Federal trade policy officials can act immediately to end tariffs and quotas on imported products and materials. With many U.S. mills and factories already at capacity, bringing in more imports at competitive prices will cool the overheated price spiral and enable many users of products that are in short supply to avoid layoffs and shutdowns.

The federal government can improve the labor supply by allowing employers to sponsor more foreign-born workers to fill positions for which there are not enough qualified applicants. In addition, the federal government should fund and approve more apprenticeship and training programs to enable students and career-switchers to acquire the skills needed for construction trades.

Officials at all levels of government should review all regulations, policies, and enforcement actions that may be unnecessarily driving up costs and slowing importation, domestic production, transport, and delivery of raw materials, components, and finished goods.

Owners need to recognize that fast-changing materials costs and availability require a quick decision regarding bids and requests for changes. For new and planned projects, owners should expect quite different pricing from previous estimates. They may want to consider building in more flexibility regarding design, timing, or cost-sharing.

Contractors need, more than ever, to closely monitor costs and delivery schedules for materials and to communicate information with owners, both before submitting bids and throughout the construction process.

Materials prices do eventually reverse course. Owners and contractors alike will benefit when that happens. Until then, cooperation and communication can help reduce the damage.

Projects Currently in Progress

Funding Sources	Project	Current Project Estimate	Grant Amounts	SRF Loans	Total Project grant,srf loan, cash and bond Revenue	Funding process & project numbers
NHDOT 80% / 20%City Bond	Strafford Square	$3,800,000.00	$1,360,000.00		$1,360,000.00	* 16531 & 23558
NHDOT 90% / 10% City Bond	Old Dover Road Tebbetts	$1,600,000.00	$1,426,658.40		$1,585,176.00	22532 & 23527
CWSRF Loan & City Bond*	Col Pines Phase 3 Gen & Sewer Fund Reimburs	$4,520,000.00		$4,000,000.00	$4,520,000.00	20549SWR & 21518 GEN
CWSRF Loan & City Bond*	Woodman General Fund & Sewer Fund reimb	$9,250,000.00		$4,900,000.00	$9,250,000.00	* 20538 & 22580
CWSRF Loan & City Bond	Rt. 11 Pump Station	$1,270,000.00		$1,200,000.00	$1,270,000.00	18545, 20559 & 22563
CWSRF Loan/possible bond	Tara Estates	$1,325,000.00		$1,325,000.00	$1,325,000.00	22558
ARPA 100% phase 2	Sewer System Master Plan	$100,000.00	$100,000.00		$100,000.00	** 22581
ARPA & CWSRF Loan	**Ledgeview Pump Station**	$1,265,000.00	$379,500.00	$885,000.00	$1,264,500.00	*** 22578
CWSRF & ARPA	Secondary Clarifier	$1,340,000.00	$390,000.00	$950,000.00	$1,340,000.00	*** 22561 $350K & 22579 $990K
CWSRF	WWTP Asset Management		$30,000.00			** 19521
ARPA	Cyber Security APP in progress	$50,000.00	$50,000.00		$50,000.00	** pending act#
DCDS	Septage Receiving Facility	$825,000.00	$825,000.00			20558
DWGWTF loan & Grant, MTBE Grant, Private Contr, City Cash & Bond	Rt202A Water Main & Tank	$12,725,000.00	$8,744,000.00	$1,293,000.00	$12,725,000.00	* 19532 & 20635
ARPA 100%	Water System Asset Mgmt	$100,000.00	$100,000.00		$100,000.00	** 22583
DWGTF Grant & Loan, ARPA & City Bond	Cocheco Well Improvement	$5,600,000.00	$2,240,000.00	$2,860,000.00	$5,600,000.00	*** 22582
City ARPA&City Bond	20" Transmission Line	$2,400,000.00	$2,000,000.00		$2,400,000.00	22570 City ARPA funds
		$46,170,000.00	**$17,645,158.40**			

Projects Pending Start Up

NHDOT / City Bond	Capacity Improvement Rt11 Assumes 80/20	$3,100,000.00	$2,480,000.00			Design funded 23553 Const Funds FY28 CIP
NHDOT / City Bond	Safety Improvements RT11 Assumes 80/20	$3,200,000.00	$2,560,000.00			Design funded 23554 Const Funds FY27 CIP
CWSRF 100%	Phase 2 Stormwater 100% Principal forgivenes	$100,000.00	$100,000.00			Not Funded Yet
CWSRF 100%	Nutrient Load Reduction	$100,000.00	$100,000.00			Not Funded Yet
		$6,500,000.00	**$5,240,000.00**			

Pre-Apps Submitted June 2022

Funding Program	Project		**Requested Amount**			**Projects to be ranked by SRF& Possibly Awarded**
DWSRF	Lead Service Inventory Assesment & Replace	unknown	$100,000.00			**Principal forgiveness for SRF 10-15%**
DWSRF	Round Pond Reservoir Improvements		$7,000,000.00			
DWSRF	Salmon falls Booster Pump Station upgrade		$2,900,000.00		Priority #1?	
DWSRF	Tufts Pond Reservoir Dam Improvements		$350,000.00			
DWSRF	WTP Electrical Upgrades		$2,100,000.00			
DWSRF	WTP Residuals Handling Improvements		$9,500,000.00			
CWSRF	Colonial Pines Sewer Extension phase 4		$9,100,000.00			
CWSRF	Salmon Falls Rd Sewer Pump Station upgrade		$1,700,000.00			
CWSRF	Sewer System Master Plan Yr 3		$356,323.00			
CWSRF	Stormwater Utility Feasibility Study		$100,000.00			
CWSRF	WWTF Asset Management		$30,000.00			
CWSRF	WWTF Nutrient load Reduction Plan		$100,000.00			
CWSRF	WWTF Standby Power Generator		$1,500,000.00			
	Total Outside Funding Requests		**$34,836,323.00**			

Current Rate SRF Loans 2.536%

General Fund

Water Fund

Sewer Fund

No Asterik means funded by annual CIP process

* Required Supplemental due to short funding after bidding

** Funded with Supplemental and is 100% Grant

*** Funded with FY2022 Supplemental due to NHDES Schedule FY2023 Request reduced due to supplemental