Public Facilities Committee Agenda

City of Newton
In City Council

Wednesday, March 14, 2018

7:30 PM – Please note Late Start Time
Chamber

Items Scheduled for Discussion:

#167-18 **Granting of easements in the Austin Street Municipal Parking Lot**
HER HONOR THE MAYOR requesting the authority to grant specific easements in the Austin Street Municipal Parking lot to permit the undergrounding of required electric service and telecommunications equipment, as noted on a plan entitled "Proposed Underground of Overhead Power & Telecommunications, Austin Street, Newton, Massachusetts", dated April 24, 2016, revised December 11, 2017, prepared by JHD. (Ward 2)

Referred to Public Facilities and Finance Committees

#172-18 **Appropriate $500,000 for snow and ice removal expenses**
HER HONOR THE MAYOR requesting authorization to appropriate the sum of five hundred thousand dollars ($500,000) from Free Cash to supplement the Department of Public Works' snow and ice operations budget.

Personnel Costs – Overtime
(0140110-513001).....$150,000
Rental Vehicles
(0140110-5273-5273) $350,000

Chairs Note: We will be joined by Sustainability Director Ann Berwick, and Energy Projects manager Bill Ferguson who will present information about municipal energy use and energy projects. Bill's presentation will include four parts: 1. Energy supply contracts, 2. Solar energy production and installations (including an early look at proposed sites for phase III solar), 3. Municipal energy use and efficiency and 4. Next steps. Ann will provide an update on the

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Newton Power Choice Program, particularly community outreach and education. We will be joined by students Ann has been working with from NNHS and Day middle school.

#45-18 **Request for updates on Newton Power Program**
PUBLIC FACILITIES COMMITTEE requesting updates from the Director of Sustainability and the Administration on the development of a program, known as Newton Power Choice, to aggregate the electricity supply and provide clean energy power options to Newton electric customers.

#151-18 **President's Appointment of James Purdy to the Energy Commission**
PRESIDENT LAREDO re-appointing James Purdy, 943 Chestnut Street, Newton Upper Falls to the Energy Commission for a term of office to expire December 31, 2019. (60 days: 04/06/18)

#152-18 **President's Appointment of Michael Gevelber to the Energy Commission**
PRESIDENT LAREDO re-appointing Michael Gevelber, 166 Melrose Street, Auburndale to the Energy Commission for a term of office to expire December 31, 2019. (60 days: 04/06/18)

R**espectfully submitted,**

Deborah Crossley, Chair

167-18

Ruthanne Fuller
Mayor

City of Newton, Massachusetts

Office of the Mayor

Telephone
(617) 796-1100
Fax
(617) 796-1113
TDD/TTY
(617) 796-1089
Email
rfuller@newtonma.gov

February 26, 2018

Honorable City Council
Newton City Hall
1000 Commonwealth Avenue
Newton Centre, MA 02459

Ladies and Gentlemen:

I write to request that your Honorable Council docket for consideration a request for a grant of easements in the Austin Street Municipal Parking lot in the area subject to the City's Reservation of Rights as more specifically set out in a certain plan entitled "Proposed Underground of Overhead Power & Telecommunications, Austin Street, Newton, Massachusetts", dated April 24, 2016, revised December 11, 2017, prepared by JHD.

- One easement to be granted to Eversource to permit the undergrounding of required electric service and telecommunications, including the installation of new poles, and conduit, wiring, transformer(s), and other incidentals to provide underground power distribution within the Parking Lot.
- Additional easement to be granted to Verizon, Comcast, and/or RCN to permit the undergrounding of telecommunication lines crossing a southern portion of the Austin Street Parking lot adjacent to the new mixed use building to be constructed by Austin Street Partners.

Thank you for your consideration of this matter.

Sincerely,

Ruthanne Fuller

Ruthanne Fuller
Mayor

City of Newton

DEPARTMENT OF PUBLIC WORKS

OFFICE OF THE COMMISSIONER
1000 Commonwealth Avenue
Newton Centre, MA 02459-1449

Ruthanne Fuller
Mayor

February 26, 2018

The Honorable Ruthanne Fuller, Mayor
1000 Commonwealth Avenue
Newton City Hall
Newton Centre, MA 02459

RE: Grant of Easements for Undergrounding Utilities and Telecommunication Equipment -- Austin Street Parking Lot and Bram Way

Dear Mayor,

The development of the Austin Street Parking Lot into a mixed-use project consisting of 68 units of housing and approximately 5,000 sq. ft. of commercial space started construction activities several weeks ago. One of the first steps in that process is the undergrounding of all utilities along the Austin Street frontage of the project, as well as undergrounding utilities into the new building itself. Grants of location will permit the utility and telecommunication providers to underground their equipment in Austin Street itself. However, Eversource, Verizon, RCN, and Comcast will also need easements from the City in order to underground their equipment in the Austin Street Parking Lot and Bram Way.

I have attached a plan prepared by Associate City Engineer John Daghlian which shows the location of the existing utility and telecommunication equipment and the proposed new locations for such equipment. All four companies will require easements from the City in order to complete the necessary equipment installations.

The City specifically retained the right to grant easements of this sort in its Reservation of Rights under the Ground Lease with Austin Street Partners, which has been working closely with the City and the utilities in terms of the necessary undergrounding activities.

Accordingly, I would ask that you docket a request with the City Council for authority to grant the necessary easements. Please let me know if you have any questions regarding the process. Thank you.

Very truly yours,

James McGonagle
Commissioner of Public Works

jmcgonagle@newtonma.gov

167-18

NOTE
UTILITIES SHOWN WERE COMPI
ACTUAL FIELD LOCATIONS, CO
NOTES, BEST AVAILABLE INFO
MAY OR MAY NOT BE CORRE
VERIFY PRIOR TO ANY EXCAV

Note:
1. All overhead electric, telephone, cable & fire alarm w
along Austin Street between Rockland Bank and Phillip
Way will be removed and placed underground as shown.

2. A new pole will be added #311–1A near pole #311–3
the property line of Rockland Bank & the Austin Street
property. This pole is needed to provide power to the
existing pole that supplies the Rockland Bank.

3. All internal poles on the site are to be removed.

4. Ornamental street lights will replace the existing pole
mounted street lights.

5. A new pole #311/1–2 will be added within the ROW
Bram Way this pole will provide power, telephone, cable
new pole set next to #401–1 that feeds the business
Walnut Street.

6. The poles along the southern property line will remai
to cost.

7. POLES #555 & #401 ALONG THE WESTERLY PROPERLY L
SHALL BE REMOVED & EXISTING VERIZON (COPPER) TO
REPLACED WITH UNDERGROUND FIBEROPTIC, WILL NEED
EASEMENT FROM ROCKLAND BANK & CITY TO VERIZON.

ABBREVATIONS

- TBR TO BE REMOVED
- TBC TO BE CUT
- R&R REMOVE & RESET
- R&D REMOVE & DISPOSE
- VIF VERIFY IN FIELD
- TBD TO BE DETERMINED
- TMH TELEPHONE MANHOLE

Legend

- EXISTING U.P.
- PROPOSED U.P.
- Light Pole
- OHW — Over Head Wire
- Proposed Eversource Vault & Conduit
- Proposed Comcast & RCN Vault & Conduit
- EXISTING SANITARY SEWER
- EXISTING STORM DRAIN
- EXISTING GAS MAIN

CONTRACTOR IS RESPONSIBLE TO HAVE ALL UNDERGROUND UTILITIES DELINATED AND VERIFIED. THE CITY OF NEWTON TAKES NO RESPONSIBILITY FOR EXISTING CONDITIONS OF UTILITIES.

Proposed Undergrounding of
Overhead Power & Telecommunica

Austin Street
Newton, Massachusetts

Scale: 1"=30' April 24, 201

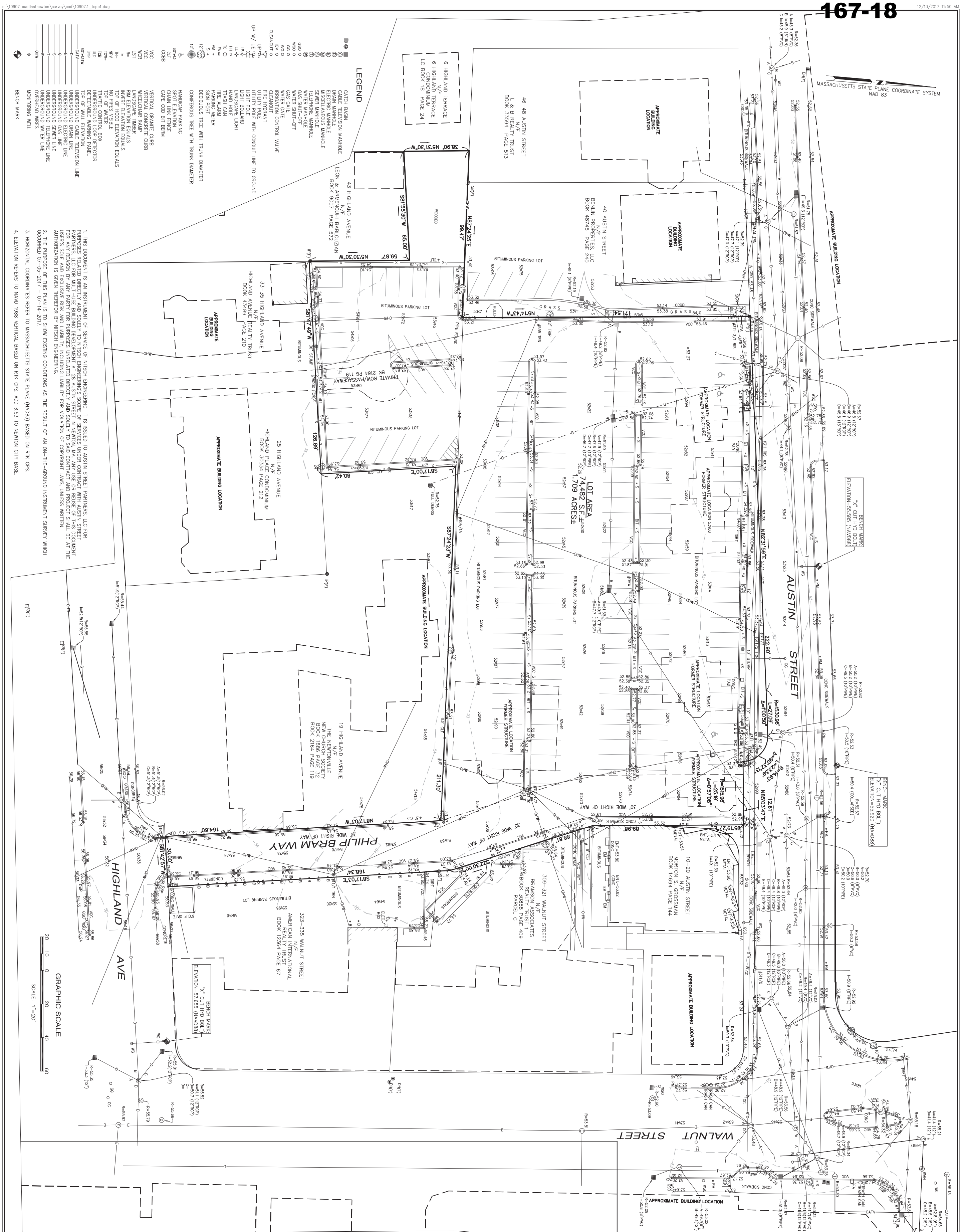
REVISED December 11, 2017

0 30 60 90 120

Sheet 1 of 1

Design By: JH
Checked By:
Drawn By: JH

167-18



EXISTING CONDITIONS

MULTI-USE BUILDING DEVELOPMENT

28 AUSTIN STREET. NEWTON, MA 02460

PREPARED FOR:

AUSTIN STREET PARTNERS, LLC

800 BOYLSTON STREET, 27TH FLOOR. BOSTON, MA 02119

REV.	COMMENTS	DATE
	REVISIONS	

PROJECT # 10907.1
FILE: 10907.1_TOPO1.dwg
SCALE: 1"=20'
DATE: 11-08-2017
DES./COMP: MEV
FIELD BOOK: 679
DRAFTED BY: MRD
CHECKED BY:

SHEET:I

EX-1

OF I REV.

Nitsch Engineering
www.nitscheng.com
120 Front Street, Suite 820
Worcester, MA 01608
T: (508) 365-1030
F: (617) 338-6472

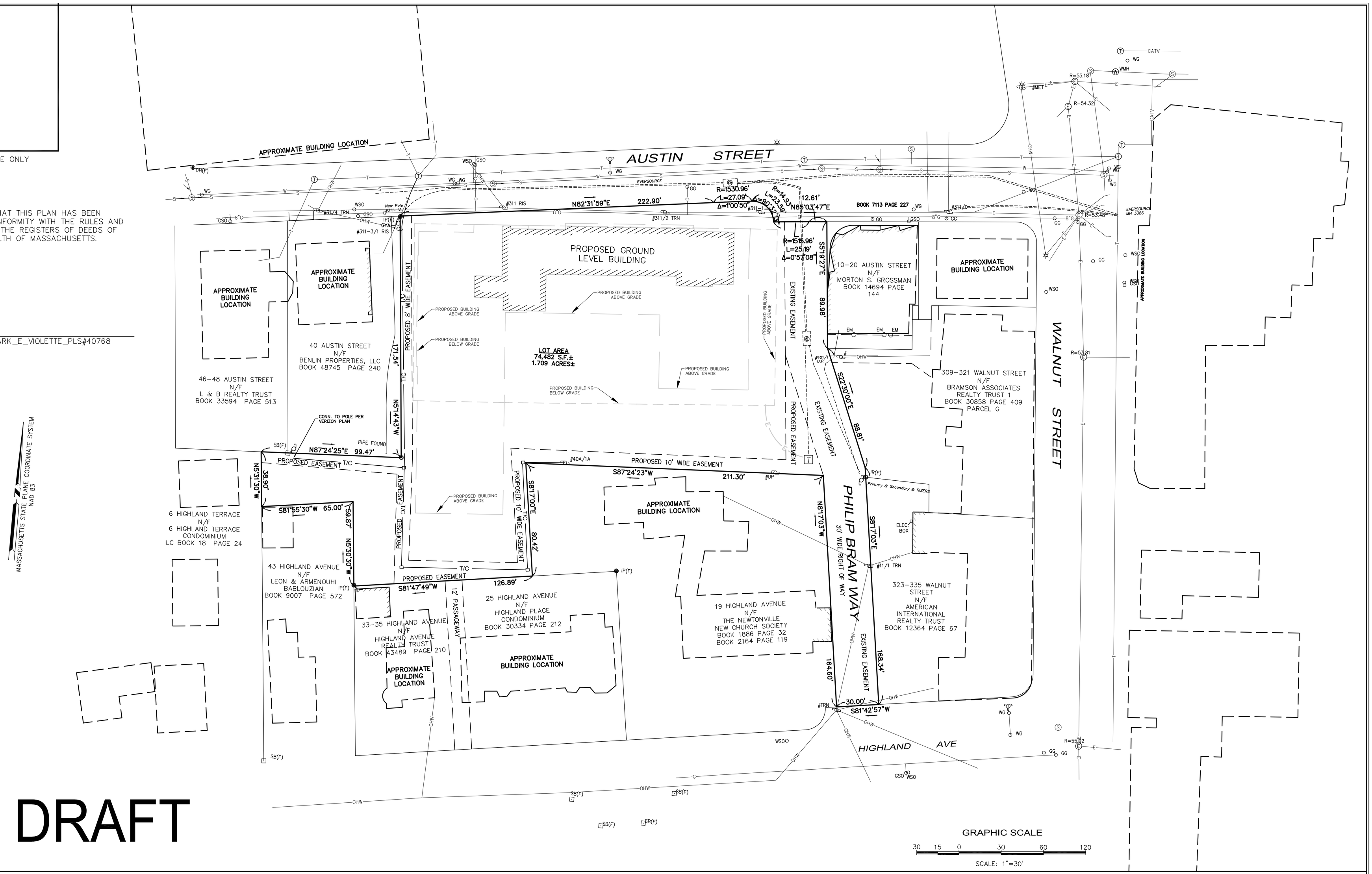
- Civil Engineering
- Land Surveying
- Transportation Engineering
- Structural Engineering
- Green Infrastructure
- Planning
- GIS

3/1/2018, 6:01 PM

FOR REGISTRY USE ONLY

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

DATE MARK_E_VIOLETTE_PLS#40768



DRAFT

GRAPHIC SCALE

30 15 0 30 60 120

SCALE: 1"=30'

Nitsch Engineering

www.nitscheng.com
120 Front Street, Suite 820
Worcester, MA 01608
T: (508) 365-1030
F: (617) 338-6472

- Civil Engineering
- Land Surveying
- Transportation Engineering
- Structural Engineering
- Green Infrastructure
- Planning
- GIS

PROJECT #	10907.1
FILE:	10907.1_EASE1.dwg
SCALE:	1"=30'
DATE:	03-02-18
PROJECT MANAGER:	MEV
FIELD BOOK:	
DRAFTED BY:	MRD
CHECKED BY:	

REV.	COMMENTS	DATE
	REVISIONS	

EASEMENT PLAN

28 AUSTIN STREET
28 AUSTIN STREET, NEWTON, MA 02460

PREPARED FOR:
CITY OF NEWTON
1000 COMMONWEALTH AVENUE, NEWTON CENTRE, MA 02459

SHEET:1

EAS1

OF 1 REV.

g:\10907 austinstnewton\survey\cad\10907.1_easel.dwg

Ruthanne Fuller
Mayor

City of Newton, Massachusetts

Office of the Mayor

#172-18
Telephone
(617) 796-1100
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(617) 796-1113
TDD/TTY
(617) 796-1089
Email
rfuller@newtonma.gov

March 5, 2018

Honorable City Council
Newton City Hall
1000 Commonwealth Avenue
Newton Centre, MA 02459

Ladies and Gentlemen:

I write to request that your Honorable Council docket for consideration a request to transfer the sum of $500,000 from June 30, 2017 Certified Free Cash to the following accounts for Snow/Ice removal.

DPW Personnel Costs – Overtime – Acct # 0140110-513001	$150,000
DPW Rental Vehicles (Contractors) – Acct# 0140110-5273	$350,000

Thank you for your consideration of this matter.

Sincerely,

Ruthanne Fuller
Mayor

PROGRAM IMPLEMENTATION (/NEWTON/PROGRAM-IMPLEMENTATION)

RENEWABLE ENERGY (/NEWTON/RENEWABLE-ENERGY)

PROVIDE FEEDBACK (/NEWTON/PROVIDE-FEEDBACK)

SUPPORT (/NEWTON/SUPPORT)

www.newtonpowerchoice.com

Newton Power Choice

The City of Newton is developing a plan for a new electricity program to be named Newton Power Choice.

The program provides an opportunity for Newton to take a bold step and significantly increase the amount of renewable energy in the community's electricity supply.

The program is a form of group electricity purchasing known as an electricity aggregation. More than 125 communities in Massachusetts are already engaged in electricity aggregation. The program will impact the supply charges on your Eversource electricity bill. (Learn how aggregation works (/newton/program-implementation/how-aggregation-works).)

With the program, the City will use the bulk buying power of the community to provide:

Greener electricity: The program will include more renewable energy than Eversource provides. (Massachusetts law requires that a minimum amount of renewable energy be included in all electricity sold in the state.)

Price stability: The program will provide a fixed price for electricity supply over a long period of time. This will make the program different from both Eversource's Basic Service, where the price changes every six months or less, and from many commercial offers in the market place. (Eversource's Basic Service is the utility's electricity supply service for customers who have not signed their own contract with an electricity supplier.)

Consumer protections: The competitive procurement process will ensure a City-vetted alternative to commercial electricity supply offers that customers may be receiving in the mail or by phone. There will be no hidden costs or other hidden provisions.

New electricity choices

As a program participant, you will have new electricity choices. You will have greater control over the environmental characteristics and price of your electricity supply.

You will receive a standard amount of renewable electricity automatically, above the minimum amount required by state law. (The standard amount is still to be determined, depending in part on electricity prices at the time the City enters into a contract with an electricity supplier).

Or you can choose to:

- **Opt up to 100% renewable electricity.**
- **Opt down to receive no additional renewable energy electricity** above the state law requirement, but retain the program benefits of price stability and consumer protections.

All choices, including the standard offering, will provide renewable electricity from New England-based renewable energy projects.

Participating and opting out

All Eversource Basic Service customers (Eversource customers who have not signed a contract with an electricity supplier) will be *automatically enrolled*. This automatic enrollment model is the state law. If you have already signed a contract with an electricity supplier, you will *not* be automatically enrolled, but it will be easy to opt into the program if you wish.

Participation is not required. You may opt out of the program before being enrolled and any time after enrollment *with no fee or penalty.*

the COLLABORATIVE

Planners Collaborative
Design Collaborative
Communications Collaborative

Jim Purdy, AICP

Director, Planning Group

Introduction

Jim is a land use and environmental planner with over 30 years of experience. He has managed transportation, open space, and pedestrian/bicycle plans and environmental documentation, worked through public participation to resolve controversies, and prepared numerous master plans and open space plans.

Before coming to the Collaborative in 2007, Jim was a Principal Planner at the Louis Berger Group and a Managing Principal at Wallace Floyd Design Group.

Project Experience

Massachusetts DOT – I-93/I-95 Interchange Environmental Permitting and Preliminary Design

Jim is the Collaborative's Project Manager for the team effort to advance improvements for this critical system interchange north of Boston. Building upon his successful role as Project Manager for the previous 93/95 Interchange Study, which achieved consensus on a design concept for this highly contentious reconfiguration of a major system interchange, Jim will oversee public outreach and communications during the environmental permitting phase of the project.

Acton, MA and Adjacent Towns – Community Challenge Grant for Shared Transportation

As part of team, Jim is providing support to the Towns of Acton, Boxborough, Littleton, Maynard, Stow and Clock Tower Office Park in Maynard, MA in analyzing, recommending and implementing a transportation network. The goal of the project is to transform the current disparate, uncoordinated and incomplete transportation services in the region into a new cooperative and coordinated transportation system.

Town of Acton, MA – Comprehensive Community Plan

As Project Manager for the Acton 2020 Plan, Jim led the effort to address the needs of all aspects of the community, from housing to transportation, town services and facilities, and fiscal well being. During Phase 1 of the work, Jim participated in an extensive Public Outreach and Visioning process, meeting with the Town's Outreach Steering Committee and assisting in the planning and conduct of well-attended public visioning workshops. For Phase II, Jim oversaw the preparation of the plan report and worked extensively with the town on its overwhelming adoption at the April 2012 town meeting.

Massachusetts DOT – Statewide Bicycle Transportation Plan

Jim provided technical support on this important project including the development of the GIS-based comprehensive inventory of on- and off-road bicycle facilities already in place, in

development, or planned. Jim also assisted with stakeholder outreach and report writing and editing.

Massachusetts DOT – State Freight and Rail Plan

Working with a team, Jim helped to prepare a land use policy analysis that addresses the preservation of sites suitable for freight-intensive use. This included the evaluation of several Massachusetts regulatory mechanisms available to address site preservation and development.

Massachusetts DOT – youMove Massachusetts Strategic Outreach

Jim supported the outreach workshops for this important civic engagement project. He facilitated group discussions at five of the YMM public workshops and prepared the Interim Report on civic engagement for the plan. As an additional task for the project, Jim helped to assemble projects to be included in the Governor's economic stimulus package.

Massachusetts DOT - Route 28x Enhancements Project

Jim Participated in the public involvement process for the Route 28X Enhancements project for the Massachusetts Department of Transportation (MassDOT). This project represented a fast-track effort to program funds from the American Reinvestment and Recovery Act (ARRA) to improve transit services in on one Boston's highest ridership bus routes. The project's effort included newsletters, development of collateral materials in three languages, door-to-door outreach, distribution of meeting flyers on buses, and media relations.

Massachusetts DOT – Transportation Enhancements (TE) Program Redesign

Jim served as Project Manager and oversaw the work of the subconsultants to identify best practices in TE programs throughout the United States. Jim also oversaw the analysis of prior and ongoing applications for TE funds that led to recommendations for system improvements.

Federal Transit Administration – ADA Compliance Reviews for New, Key, and Renovated Rail Stations

Jim is the Collaborative's Project Manager for the ongoing ADA Rail Stations contract and has performed ADA rail station compliance reviews for FTA's Office of Civil Rights since 2007. This has included assessments of rail stations at 12 transit systems throughout the United States.

He was the principal author of the FTA Advisory Circular on Rail Station Accessibility.

Federal Transit Administration – ADA Compliance Reviews for ADA Complementary Paratransit, Stop Announcements and Route Identification, and Bus Accessibility Equipment

Since 2007, Jim has participated in or led more than 17 ADA compliance reviews for FTA's Office of Civil Rights. On several of these reviews, he has served as FTA's representative during on-site visits to transit systems.

Other Project Experience

- Vermont Agency of Transportation - Accelerated Environment Impact Statement for the Circ-Williston Connector
- Town of Bedford, NH and the Nashua Regional Planning Commission – New Hampshire Route 101 Corridor Study

- New Hampshire Department of Transportation – New Hampshire Route 16 Public Involvement Plan
- New York Metropolitan Transit Authority – Fulton Street Transit Center
- Massachusetts Highway Department – Massachusetts Pedestrian Plan
- Boston Redevelopment Authority – Dorchester Avenue Streetscape and Transportation Action Plan
- Boston Transportation Department – East Boston Transportation Action Plan
- Town of Peterborough, NH – West Peterborough Improvement Plan
- Town of Middletown, RI – Development Impact Fee Study
- Town of Winchester, MA – Strategic Plan Update
- Private Client – Environmental Documentation for Transit-Oriented Development
- Various cities in Massachusetts – Open Space and Recovery Action Plans
- Town of Reading, MA – Planned Unit Development Bylaw
- Boston Redevelopment Authority – South Bay Development Study
- Massachusetts Highway Department and Massachusetts Turnpike Authority – Supplemental Environmental Impact Statement/Environmental Impact Report volume on the I-93 Central Artery/Tunnel Charles River Crossing
- Massachusetts Highway Department – Bridge Design Review Committee Report
- Massachusetts Institute of Technology – Northeast Sector Campus Plan
- Massachusetts Highway Department – Environmental Permitting Highway Projects, including Route 1/Walnut Street bridge reconstruction in Saugus and the Route 2 Crosby's Corner reconstruction
- The New England Transportation Initiative
- Federal Aviation Administration – Part 150 Airport Noise Compatibility Planning Study of Pease International Tradeport
- Logan International Airport – Logan Ground Access Study Environmental Impact Report
- Massachusetts Department of Public Works and the Massachusetts Highway Department – Central Artery/Third Harbor Tunnel EIS/R
- Massachusetts Port Authority Development Department – Commonwealth Flats Development
- City of Cambridge, MA – Fresh Pond Parkway Reconstruction
- Massachusetts Department of Environmental Management – Boston Harbor Islands Master Plan

Professional Activities

- Certified, American Institute of Certified Planners
- Member, American Planning Association
- Member, Massachusetts Association of Planning Consultants

Education

- Master of City Planning, Massachusetts Institute of Technology, 1978
- Bachelor of Science in Physics, University of Michigan, 1969

MICHAEL A. GEVELBER

Boston University, Manufacturing Engineering

Education

MASSACHUSETS INSTITUTE OF TECHNOLOGY Cambridge, MA

Ph.D in Mechanical Engineering, August 1988. Specialties: Controls, dynamics, heat transfer, and thermodynamics. Thesis: "Dynamics and Control of the Czochralski Process", G. Stephanopoulos, Dept. of Chemical Engineering, advisor.

MASSACHUSETS INSTITUTE OF TECHNOLOGY Cambridge, MA

S.M. degree in Mechanical Engineering, February 1984. Thesis: "Control System Analysis and Dynamic Simulation of an OTEC Power Plant", D.N. Wormley, advisor.

BROWN UNIVERSITY Providence, RI

Sc.B. in Physics, June 1978. Thesis: "Nuclear Magnetic Resonance Study of Motional Narrowing in Glass and Crystalline Cadmium Lithium Nitrate"
Honors in Physics, 1978, Sigma Xi, 1978

Experience

Department of Mechanical Engineering, Boston University Boston, MA
Assistant (1988) and Associate Professor (1996). Research interests in advanced control design for enhanced materials processing including control and system design, modeling, instrumentation, and development of control analysis techniques. Co-chair of the Universities Energy Working Group and member of the Universities Sustainability Committee.

Cyber Materials LLC Newton, MA
Founder (2004) and Manager. Development and commercialization of advanced control and sensor solutions to improve industrial material processing capabilities.

Consultant Cambridge, MA
August 1983 to January 1985. Simulation and control analysis for industrial process.

U.S. Department of Energy Washington, DC
Sept. 1979 to Feb. 1981. Analyst in Office of Plans and Technology Assessment, Fossil Energy.

Energy and Environmental Analysis Inc. Washington, DC
November 1978 to September 1979. Analyst. Equipment modeling and cost estimation.

Professional Activities

- Editorial Board, "Robotics and Computer Integrated Manufacturing, An International journal of manufacturing and product and process development", IFAC, the International Federation of Automatic Control, 2003-2009.

- Founder (2005-2010) and co-director of Burr Elementary School Science and Engineering Discovery Week, a program that brings scientists and engineers into the classroom to give students a feeling of what real scientists and engineers do and why its exciting.

- Thermal Spray Society Program Committee, ASM International, 2003-2010

- International Thermal Spray Conference Program Committee, 2003-2010.

- Session Chair, International Symposium on Flexible Automation, July 2006, Osaka Japan.

- Program Committee for Thermal Spray Society Workshop: Consistency & Reliability of Thermal Spray Coatings: Issues and Practical Solutions: Sensors and Controls, Fall 2004.

- INEEL Summer Faculty Fellowship (1998, 1999)

- Program Committee for 3rd International Workshop on Modeling and Crystal Growth, 2000

- Program Committee for Japan-USA Symposium on Flexible Automation, 1994, 1996

- Journal Reviewer:
  - Automatica
  - Polymer
  - International Journal of Modelling and Simulation
  - IIE Transactions on Design and Manufacturing
  - IEEE Transactions on Control Systems Technology
  - Journal of Crystal Growth
  - Journal of Heat and Fluid Flow
  - Journal of Dynamic Systems, Measurement, and Control
  - Journal of Engineering for Industry.

* Reviewer, International Federation of Automatic Control (IFAC) conference proceedings

- Proposal reviewer for NSF SBIR program 1997-2002, research proposal reviewer NSF 1998-2003, 2009 for the Division of Design Manufacture and Industrial Innovation, Nanotechnology Program

- Organizer of Emerging Technology and Best Industry Practices Seminar series, Boston University, Manufacturing Engineering Department, 1992-2002.

New Course Development:

- **MN 500/GE 520 Course on Analysis of Energy Conservation/Supply Alternatives: BU Case Study**, offered in conjunction with the Center for Energy and Environmental Studies. Multi-

disciplinary evaluation of technical, economic, and organizational issues of conservation options for the Charles River Campus of Boston University.

- **EK 546: Assessment of Sustainable Energy Technologies**: This course provides students with the background needed to asses the potential for energy efficiency and effectiveness of different technologies, the related economics, identify the key technical risks in emerging technologies, evaluating the life cycle implications of emerging technologies, manufacturing issues, as well as estimating performance.. Examples are drawn from a variety of emerging technologies.

Patents

1) "Control System for the Czochralski Process", M.A. Gevelber and G. Stephanopoulos, U.S. Patent no. 4,857,278, 8/89

2) "Interface Angle Estimation System", M.A. Gevelber and A.T. Patera, U.S. Patent no. 4,943,160, 7/90.

3) "Method for Closed-Loop Control of CVD Process", M.A. Gevelber and M. Toledo-Quinones, U.S. Patent no. 6,162,488, 12/2000.

4) "Feedback Enhanced Plasma Spray Tool", M.A. Gevelber, D. Wroblewski, Fincke, W. D. Swank, R.L. Bewley, D.C. Haggard, U.S. Patent 6,967,304, 11/22/2005.

4) "Feedback Enhanced Plasma Spray Tool", M.A. Gevelber, D. Wroblewski, U.S. Patent divisional application, molten plasma flux control, application, 9/2007, 20060198944, granted 4/11.

5) "Ebeam Vision System for Monitoring and Control", Michael Gevelber, Brian Vattiat, and Adam Brewster, U.S. Patent no. 7,479,632, 1/20/2009.

6) Michael Gevelber and Xuri Yan, Provisional Patent Application, 10/09/2007, "Control System for Electrospinning of Nano-Fibers" (60/998,214), BU case 07-79.

7) Vattiat, B., Wroblewski, D., Gevelber, M., "Plasma State and Flux Sensor", patent application (serial no. 12/008787), joint Boston University/Cyber Materials application January, 2008.

Referred Publications: Journal, Conference Proceedings, and Book Chapters,

1. J. Winkler, M. Neubert, J. Rudolph, N. Duanmu, and M. Gevelber, Chapter 3, "Czochralski Process Dyanamics and Control Design", in "*Crystal Growth Processes Based on Capillarity: Czochralski, Floating zone, shaping and crucible techniques*", edited by Thierry Duffar, April 2010.

2. D. Wroblewski, G. Reimann, M. Tuttle, D. Radgowski, M. Cannamela, S. Basu, M. Gevelber, "Sensor Issues and Requirements for Developing Real-Time Control for Plasma Spray Deposition", *Journal of Thermal Spray Technology*, Vol. 19(4), June 2010, pp. 723—735.

3. X. Yan, M. Gevelber, "Investigation of Electrospun Fiber Diameter Distribution and Process Dynamics", published in the Proceedings of the Electrostatics Joint Conference, Boston University, June 16-18, 2009 and in the *Journal of Electrostatics*, 68 (October 2010), pp. 458-264.

4. E. Speyerer, M. Gevelber, D. Radgowski, "Development of an Adaptive System ID Method for Enabling Advanced E-Beam Sweep Pattern Design", pp 1-8 TuAT6.1, in the 2010 ASME Dynamic Systems and Control Conference Proceedings, ed P. Meckl, Cambridge MA, September 2010.

5. M. Gevelber, D. Wroblewski, M. Cannamela, S. Basu, D. Radgowski, and M. Tuttle, "Sensor and Control Design Issues for Developing Real-Time Deposition Rate Control for Plasma Spray", pp 1-8, TuAT6.6, in the 2010 ASME Dynamic Systems and Control Conference Proceedings, ed P. Meckl, Cambridge MA, September 2010.

6. X. Y and and M. Gevelber, "Process Dynamics and Control Analysis for Electrospinning Nanofibers", pp1-8, WeBT4.1, in the 2010 ASME Dynamic Systems and Control Conference Proceedings, ed P. Meckl, Cambridge MA, September 2010.

7. X. Yan, and M. Gevelber, "Elecrospinning of Nanofibers: Analysis of Diameter Distribution and Process Dynamics for Control", In the "2010 International symposium on Flexible Automation" Conference Proceedings, ed. N. Sugimura and J. Cao, July 2010, Tokyo Japan

8. M. Gevelber, D. Wroblewski, M. Canemella, S. Basu, "Sensor Design Issues for Implementation of Real-Time Depsoition Rate Control for Plasma Spray", In the "2010 International symposium on Flexible Automation" Conference Proceedings, ed. N. Sugimura and J. Cao July 2010, Tokyo Japan

9. M. Gevelber, D. Wroblewski, B. Vattiat, O. Ghosh, M. VanHout, and S.N. Basu, "Issues and Requirements for Developing a Plasma Spray Deposition Rate Sensor for Real-time control", *International Thermal Spray Conference*, Maastricht, The Netherlands, June 2-4, 2008, Conference Proceedings: ed. E. Lugscheider, 2008, pp 912-916.

10. D. Wroblewski, O. Ghosh, A. Lum, M. VanHout, S.N. Basu, M. Gevelber, and D. Willoughby, "Analysis of Plasma Spray Particle State Distribution for Deposition Rate Control", *International Thermal Spray Conference*, Maastricht, The Netherlands, June 2-4, 2008, Conference Proceedings: ed. E. Lugscheider, 2008, pp 838-843

11. Gevelber, D. Wroblewski, M. VanHout, O. Ghosh, D. Willoughby, S. Basu, "Sensor and Control Design Issues for Implementation of Real-Time Deposition Rate Control for Plasma

Spray", ASME International Mechanical Engineering Congress , Oct 31-Nov. 6, 2008, Boston, IMECE2008-68958, pp 10.

12. D. Wroblewski, O. Ghosh, A. Lum, D. Willoughby, M. VanHout, K. Hogstrom, S. Basu, M. Gevelber "Modeling and Parametric Analysis of Plasma Spray Particle State Distribution for Deposition Rate Control", IMECE2008-68752, *ASME International Mechanical Engineering Congress*, Oct 31-Nov. 6, 2008, Boston.

13. X. Yan, M. Gevelber, "Analysis of Electrospinning Nanofibers: Diameter Distribution, Process Dyanmics, and Control", *ASME International Mechanical Engineering Congress* , Oct 31-Nov. 6, 2008, Boston, IMECE2008-68299, pp8

14. G. Reimann, D. Radgowski, M. Gevelber, "Methods for Improving Optical Coating Quality for E-beam Deposition: Minimizing Deposition Rate Variations and Manufacturing Case Studies", *51st Annual Technical Conference Proceedings of Society of Vacuum Coaters*, 2008 Apr 19-24 Chicago IL , Apr 19-24, 2008 Chicago IL , pp 427-432.

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26. Reimann, G., Gevelber, M., Vattiat, B., Hildebrand, J., Hildebrand, C., "Robust System Identification and Optimized Tuning for Control of Evaporation Processes", Proceedings of the Society of Vacuum Coaters 48th annual technical conference. Denver, CO, 2005, pp 697-702.

27. Xu, B., Gevelber, M., Smith, D., Vattiat, B., "Improving Rate Control in Electron-Beam Evaporated Optical Coatings:, maintaining source surface uniformity for large size laser optics coatings and evaluation of system drift", Proceedings of the Society of Vacuum Coaters 48th annual technical conference. Denver, CO, 2005, pp 400-405.

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42. M. Gevelber, D. Wroblewski, J. Fincke, W.D. Swank, "System Characterization and Plasma Particle Distribution Analysis for Development of Closed Loop Control for Plasma Spray", HTD Vol. 366-3; Proceedings of the ASME: Heat Transfer Division, November 2000, Vol 3, pp. 419-426.

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58. Gevelber, M.A., ``A Geometric Analysis Method for Control Structure and System Design", in Control Methods for Manufacturing Processes}, edited by J.L. Stein, Y. Koren, J. Holmes, ASME DSC vol. 18, December 1989, pp 123-128.

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Conference Presentations

1. M. A. Gevelber, "Process Dynamics and Measurement Considerations for Developing Electrospinning Control: needle and free surface system", presented at "Nanofibers for the 3rd Millennium", NC State, The Nonwovens Institute, August 2010.

2. M.A. Gevelber, M. Cannemela, D. Wroblewski, S. Basu, "Alternative Real-Time Control Strategies and Sensing Requirements for Improving Thermal Spray Performance", presented at paper given at the International Thermal Spray Conference, Las Vegas, May 2009.

3. D. Wroblewski, M. Cannamela, M. Gevelber, O. Ghosh, M. VanHout, A. Lum, K. Hogstrom, S. Basu , "Plasma Spray Process Modeling for Control: Effect of Torch Inputs on Particle State Distributions", paper given at the International Thermal Spray Conference, Las Vegas, May 2009.

4. M. A Gevelber, "Alternative Control Strategies and Requirements for Improving Thermal Spray Performance", presented at the "Symposium on Improving Reliability and Consistency

in Thermal Spray, Dec 2-3 , 2008, Montreal Quebec, organized by the ASM Thermal Spray Society.

5. X. Yan, M. Gevelber, "Investigation of Electrospinning Parameters that Determine Fiber Diameter Distribution" The Fiber Society 2008 Technical Conference, Oct 1-3, 2008, Boucherville Canada, Abdellah Ajji, Chair

6. M. Gevelber and X. Yan, "Analysis of Electrospinning Process Dynamics and Resulting Nanofiber Diameter Distributions" The Fiber Society 2007 Technical Conference, Oct 911, 2007, University of California at Davis, CA, , You-Lo Hsieh, Chair

7. Gevelber, M., Ghosh, O., Cui, C., Wang, H., Basu, S., Wroblewski, D., "Alternative Strategies for Plasma Sprayed Coating Thickness Control", paper given at the International Thermal Spray Conference, Seattle, May 2006.

8. Reimann, G., Vattiat, B., Brewster, A., Gevelber, M. A., Hildebrand, J., Hildebrand. C., "Robust System Identification and Optimized Tuning for Control of Evaporation Processes: benchmark study results of manufacturing performance", paper given at AVS, Boston November 2005.

9. Gevelber, M., "Manufacturing Performance Evaluation of Alternative Control Strategies for IGT Thermal Barrier Coatings", Combustion Turbine Coatings Symposium, Houston Texas, October 26, 2005, invited.

10. Michael Gevelber, Brian Vattiat, Chenhuan Cui, Boston University, Manufacturing Engineering, Larry Pollard, William Barker, Progressive Technologies, David Harter, Siemens Westinghouse Power Corporation-Stationary Fuel Cells, Performance Comparison of Various Sensor Systems and Plasma Spray Torches", poster given at the International Thermal Spray Conference, Basel, May 2005.

11. M. Gevelber, C. Cui, B. Vattiat, D. Wroblewski, S. Basu, "Real-Time Control for Plasma Spray: Production requirements, sensor issues, control design problems and solutions", paper given at the Sensors and Controls 2004 Workshop, International Thermal Spray Society, October 2004

12. Gevelber, M., B. Xu, D. Smith, "Improved Rate Control for E-beam Evaporation and Evaluation of Optical Performance Improvements", presented at the Optical Interference Coating Conference of the OSA, Tuscon, June 2004.

13. Basu, S.N., Ye, G., Cui, C., Gevelber, M., Wroblewski, D., Fincke J.R., and Swank, W.D., Engineering Plasma Sprayed Coating Microstructure by Advanced Control, presented at the Fall MRS Meeting, Dec. 2-6, 2002, Boston, MA.

14. Ye, G., Basu, S., Wroblewski, D., Gevelber, M., Fincke, J., Swank, W, "Characterization of the Plasma Spray Process for the Development of Closed Loop Control", presented at the ASM Materials Solutions Conference, Cincinnati, November 1999.

15. Khare, R., Wroblewski, D., Gevelber, M.A., "2-D Thermal Modeling of Splat Cooling on Rough Substrates", presented at ASM Materials Solutions Conference, Cinncinnati, November 1999.

16. Y. Chen, Z. Ren, P. Nair, and M. Gevelber, "Model Based Control Analysis of the Czochralski Process", Presented at the 13th International Conference on Crystal Growth, Jerusalem Israel, July 1998.

17. Y. Chen, J. Jiang and M. Gevelber, "Process Modelling Analysis for Enhanced Control of INP Synthesis", Presented at the 13th International Conference on Crystal Growth, Jerusalem Israel, July 1998.

Invited Seminars, presented by M. Gevelber

1. "Process Control for Improving Materials Processing Capabilities and Sustainability Initiatives at Boston University, presented at the ASM Boston Chapter meeting, November 2010.

2. "Process Dynamics and Measurement Considerations for Developing Electrospinning Control: needle and free surface systems", presented at the Elmarco and University of North Carolina Nonwoven Institute conference: "NANOFIBERS FOR THE 3RD MILLENNIUM 2010", August 2010, Raleigh, North Carolina.

3. "Boston University's Plasma Spray Research", presented to China Academy Institute of Machinery (CAM), Zhejiang Branch and Hangzhou Turbine Power Corp, Hangzhou, China, July 2010.

4. "Electrospinning Process Dynamics and Fiber Diameter Distributions for Development of Real-Time Control Donaldson, Minneapolis, MN, March 2007.

5. Real-time Control for Improving Materials Processing Capabilities: examples from e-beam deposition of precision optical coatings and plasma spray of TBC and fuel cells", M.I.T., Laboratory for Manufacturing, October, 2006.

6. "Advanced Control for Improved Electron Beam Deposition for Precision
    a. Optical Coatings", Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, Jiading, Shanghai, July 2006.

7. "Advanced Control for Improved Electron Beam Deposition for Precision", Shincron LTD, Tokyo, July 2006.

8. "Advanced Control for Improving Materials Processing Capabilities: examples from e-beam deposition for optical coatings and plasma spray of TBC and fuel cells", Department of Mechanical Engineering. UCLA May 2006.

9. "Advanced Control for Improving Materials Processing Capabilities: examples from e-beam deposition for optical coatings and plasma spray of TBC and fuel cells", Department of Mechanical Engineering, UCSB May 2006

10. Gevelber, M., "Analysis of Electrospinning Dynamics for Development of Real Time Control:, Department of Polymer Chemistry, University of Akron, February 2006

11. Gevelber, M., "Development of Real-Time Control for Plasma Spray: sensing and nonlinear issues, University der Bundeswehr, Munich, Department of Electrical Engineering, November 2005.

12. Gevelber, M., "Development of Real-Time Control for Electron Beam Coatings for Precision Optics", Leybold, Aseneu Germany, November 2005.

13. "Advanced Real-time Control for Enhanced Processing Capabilities for E-beam Deposited Optical Coatings", Laboratory for Laser Energetics, University of Rochester, August 2003.

14. "Advanced Control for Engineering Plasma Sprayed Coating Structure: system characterization and implementation results", Mechanical Engineering Department, University of Toronto, Center for Advanced Coating Technology, August 2003.

15. "Advanced Control for Engineering Plasma Sprayed Coating Structure: system characterization, sensor issues, and implementation results", Institute of Materials Science, University of Connecticut, June, 2003.

16. "Real-Time Control for Improving Materials Processing Capabilities: examples from e-beam deposition of optical coatings and plasma spray of TBC and fuel cells", Mechanical Engineering Department, University of California, Berkeley, May 2003.

17. "Real-Time Control for Plasma Spray: production issues and distribution implications" SUNY Stony Brook, Center for Thermal Spay, Feb. 2003.

18. "Real-Time Control for Plasma Spray: production issues and distribution implications" NIST, Ceramics Division, Washington DC, Dec. 2002.

19. "Real-Time Control for Plasma Spray: performance evaluation and production/implementation issues", SURFTEC annual meeting, Industrial Materials Institute, National Research Council Canada, Montreal, November 2002.

20. "Advanced Control for Engineering Plasma Sprayed Coating Structure: system characterization, sensor issues, and implementation results", September 2001, presented at the University of Connecticut, Department of Mechanical Engineering.

21. "Real-Time Control for Plasma Deposition: system characterization, sensor issues, and implementation results", Tufts University, Thermal Manufacturing Workshop, School of Engineering, M. Gevelber, June 2001,

22. "Dynamic Modeling Analysis for Control of CVD" , University of California, Santa Barbara, Mechanical Engineering Seminar, May 1998

23. "Process Control for Enhanced Processing of Engineered Materials", June 16-20, 1997 at M.I.T., part of the New Developments in Manufacturing Process Technology Seminar at the Laboratory for Manufacturing and Productivity.

24. "Advanced Control for Enhanced Processing of Engineered Materials", IEEE Control and Systems Society, Boston, January 15, 1997,

25. "Real-Time Control of CVD", February 1998, Kennametal.

26. "Real-Time Control of CVD", October 1997, Northeastern University.

27. "Dynamic Modelling of CVD for Real-time Control of Microstructure", NASA Lewis, Systems Dynamics Branch, June 16, 1995.

28. "Dynamic Modelling of CVD for Real-time Control of Microstructure", RPI Mechanical Engineering Seminar, March 23, 1995.

29. "Dynamic Modelling of CVD for Real-time Control of Microstructure", University of Minnesota, Mechanical Engineer Seminar Program, March 8, 1995.

30. "Modelling of Induction Plasma Deposition for Control Design", University of Minnesota, Guest Lecturer, Plasma Processing Graduate Seminar, March 8, 1995.

31. "Dynamic Modeling of CVD for Real-Time Control of Coating Microstructure", Brown University, Joint Materials Science/Solid Mechanics Seminar, Sept. 28, 1994.

32. "Control of Materials Processing", Kao Corp, Recording and Imaging Science Lab, Tochigi Japan, July 18, 1994.

33. "Dynamic Modelling of CVD for Real-Time Control of Microstructure", Berkeley, Mechanical Engineering Department, April 1994,

34. "Dynamic Modelling of CVD for Real-Time Control of Microstructure", Stanford University, Electrical Engineering Department, April 1994.

35. "Dynamic Modelling of CVD for Real-Time Control of Microstructure"., University of Michigan, March 1994.

36. "Modelling for Control of Induction Plasma Deposition", Universite de Limoges, Laboratoire de Materiaux Ceramiques et Traitements de Surface, P. Fauchais, November 1993.

37. "Control of Materials Processing", MIT, Sematech Center of Excellence meeting, March 5, 1993.

38. "Modelling and Control of Induction Plasma Deposition", University of Wisconsin, Plasma-Aided Manufacturing Research Center, March 6, 1992.

39. "Modelling and Control of Induction Plasma Deposition", GE Engineering Materials Technology Laboratories, Lynn MA, October 9, 1991.

40. "Dynamics and Control of Czochralski Crystal Growth", University of Rochester, December 13, 1988.

41. "Dynamics and Control of Czochralski Crystal Growth", Harshaw/Fitrol Comp., , December, 1988.

42. "Materials Processing: Design and Control", Boston University Minuteman Seminar: Frontiers in Manufacturing,
43. October 1988.

44. "Control Design Consideration for the Czochralski Process", General Electric Corporate Research & Development, Control Division Schenectady. September 1987.

45. "Dynamics and Control Design for the Czochralski Process", New England Section of the American Association for Crystal Growth, Boston. May 1987.

Research Grants

1. "Analysis for Development of Electrospinning Control Concepts", to U.S. Army Natick Soldier RD&E Center, 5/1/11-4/30/12, $85,430.

2. "Real-Time Control for Engineering Electrospun Nanofiber Diameter Distributions for Advanced Applications", Gevelber, PI, NSF, 9/2008-8/2011, $224,100

3. "STTR Phase II: Development of Advanced E-Beam Sweep Patterns and Control Systems", Cyber Materials LLC / NSF, $151,217.00, 4/1/06 - 3/31/08, co PI

4. "GOALI: Engineering Coating Microstructure Through Advanced Plasma Spray Processing: Fuel Cell and Thermal Barrier Applications ", National Science Foundation, $398,954.00, 5/1/03 - 4/30/07, PI

5. "GOALI: Engineering Coating Microstructure Through Advanced Plasma Spray Processing: Fuel Cell and Thermal Barrier Applications (REU Supplement)",
6. National Science Foundation, $12,000.00, 5/1/05 - 4/30/07, PI

7. STTR Phase 1 Proposal: Advanced Control of Electron-Beam Deposition for High Precision Optical Coatings, NSF SBIR, BU subcontract: $58,240, 1 year, PI: Douglas Smith, Vacuum Process Technology, Michael Gevelber, co-PI

8. Proposal to Develop Advanced Control Capabilities for E-beam Deposition, Sandia, via VPT $34,656 for 8 months, Gevelber (PI), 8 months,

9. "Control Development and Modelling for Enhanced Crystal Growth: Application to Novel New Technologies and Extension of Conventional Capabilities", PI, National Science Foundation, $270,000.00, 9/1/01 - 8/31/05

10. "Control Development and Modelling for Enhanced Crystal Growth: Application to Novel New Technologies and Extension of Conventional Capabilities (REU)", PI, National Science Foundation, $30,000.00, 9/15/01 - 8/31/05

11. Development of Advanced Instrumentation for Student Research and Education on Plasma Coating Crack Formation Fundamentals, equipment grant, $88,900, NSF/DMR, Gevelber (PI), Wroblewski, and Basu.

12. Supplemental Research Experience for Undergraduates, NSF, Gevelber (PI) $12,000.

13. Integrated Plasma Deposition Processing for Advanced Control of Coating Structure", $334,000 for 3 years, NSF, Gevelber (PI), Wroblewski, and Basu.

14. DURIP Equipment Proposal: Real Time Control for Advanced Materials Processing", $120,000 from AFOSR, Gevelber (PI), Wroblewski, Basu

15. Intelligent Process Control for Czochralski Crystal Growth, ARPA/AFOSR through SUNY Stony Brook, Gevelber, co-PI, 2 year for $149,594.

16. Research Gift from Intelcore, related to work in analysis of control performance for Fiber Preform Manufacture and Fiber Draw: $34,000. Summer 2001.

17. "Supplemental Research Experience for Undergraduates," NSF, from 1998-2003, $32,000

18. Intelligent Process Control for Czochralski Crystal Growth, ARPA/AFOSR through SUNY Stony Brook, Gevelber, co-PI, 3 year for $224,391.

19. Integrated Plasma and Chemical Vapor Deposition Processing for Advanced Control of Coating Structure", $12,000, 1 year grant from United Technologies University Program, Gevelber, Wroblewski and Basu.

20. Real-Time Control of Engineered Coating Microstructure, Gevelber (PI) and Sarin, NSF, $179,706, 3 years.

21. Modelling and Control of Plasma Deposition for Enhanced Materials Production, Gevelber, NSF, $204,155, 3 years

22. Insitu Intelligent Materials Processing Equipment Grant, Gevelber and Sarin, NSF, $47,066.

23. System and Control Analysis of Low Pressure Plasma Deposition", Gevelber, NSF, $70,000 (Research Initiation Award).

Related Research Grants through Cyber Materials with significant Boston University Involvement

1. Air Force SBIR, Phase 1, "Control of Plasma Sprayed Coating Structure", $100,000 [with S, Basu]

2. NSF SBIR, Phase II grant, "Plasma Spray Sensor Development", $500,000 [with Donald Wroblewski].

3. NSF SBIR, Phase I grant, "Plasma Spray Sensor Development", $100,000 [with Donald Wroblewski]

Ph.D Thesis Supervision (advisor and first reader).

1. Xuri Yan, "Electrospinning of Nanofibers: analysis of diameter distribution and process dynamics for control", Ph.D. in Mechanical Engineering, Oct. 2010.

2. Chenhuan Cui, " Experimental and modeling analysis of plasma spray nonlinearities for advancd process control design", Ph.D. in Manufacturing Engineering, 2007.

3. Bing Xu, "Experimental and modeling analysis for developing improved electron beam processing capabilities for precision optical coatings", Ph.D. in Manufacturing Engineering, 2007.

4. Ning Duanmu, "Modeling, dynamics, and control of the Czochralski crystal growth process", Ph.D. in Manufacturing Engineering, 2006.

5. Manuel Toledo-Quinones, "Dynamic Modelling of Chemical Vapor Deposition for Real-Time Control", May 1995, Ph.D. in Electrical Engineering,

M.S Thesis advisor and first reader:

1. Onomitra Ghosh, "Modeling and sensing strategies of plasma spray particle distributions for deposition rate control", 2007, M.S. in Manufacturing Engineering.

2. Brian Vattiat, "Analysis of the Sensor and Measurement Requirements for Feedback Control of Plasma Spray Processes", January 2004, MS, Mechanical Engineering,

3. D. Wilson, "Modelling of Czochralski Crystal Growth for Advanced Control Design", May 2002, M.S. in Electrical Engineering,

4. R. Liu, "Modelling and Dynamic Analysis of TiN Deposition for Control of CVD", May 1998, M.S. in Manufacturing Engineering,

5. M. Sikka, "Modeling for Control of Plasma Deposition: Plasma-Particle Interactions and Solidification Process", May 1997, M.S. in Manufacturing Engineering,

6. E. Sumitra, "Modeling and Analysis of CVD for Closed Loop Control: Deposition Physics, Dynamic Characterization and Experimental Verification", May 1997, M.S. in Manufacturing Engineering,

7. C. Smith, "Low Order Modelling and Control Analysis of Induction Plasma Deposition", May 1995, MS in Manufacturing Engineering, First Reader. Publications: [12, 17

8. M. Bufano, "Dynamic Modelling of Heat and Mass Transport for Control Of Chemical Vapor Deposition", January 1995, MS in Mechanical Engineering,

9. M. Sharma, "Control Structure Analysis and Design for Poorly Conditioned Multivariable Systems", May 1993, MS in Manufacturing Engineering,

10. K.S. Narendra, "Modelling and Control of Induction Plasma Deposition", January 1992, MS in Manufacturing Engineering.